

MANDATORY STANDARD NOTES FOR GRADING PLANS

1. ALL FOOTING FORMWORK ELEVATIONS AND SETBACKS ARE TO BE CONFIRMED BY A REGISTERED PROFESSIONAL ENGINEER OR REGISTERED ONTARIO LAND SURVEYOR PRIOR TO THE PLACING OF ANY CONCRETE.
2. PRIOR TO THE SUPERSTRUCTURE WORKS PROCEEDING AND THE RELEASE OF THE COMPLETION STAGE PERMIT, THE OWNERS CONSULTANT MUST CERTIFY THAT THE TOP OF FOUNDATIONS ARE IN CONFORMITY WITH THE GRADING PLAN REVIEWED BY THE MUNICIPALITY.
3. ALL RAINWATER LEADERS SHALL DISCHARGE ONTO CONCRETE SPLASH PADS AT GROUND LEVEL AT THE LOCATIONS INDICATED ON THIS PLAN.
4. EXISTING BOUNDARY ELEVATIONS ALONG THE SITE PERIMETER SHALL REMAIN UNDISTURBED. DRAINAGE RECEIVED FROM ADJACENT PROPERTIES SHALL BE ACCOMMODATED AND DRAINAGE FROM THE SUBJECT LANDS SHALL BE SELF-CONTAINED.
5. ALL YARD AREAS SHALL RECEIVE A MINIMUM OF 100MM OF TOPSOIL PLUS SOD.
6. PURSUANT TO BY-LAW NO.41-07, ALL TREES WITHIN 6 METERS OF THE CONSTRUCTION ACTIVITY*, MUST BE PROTECTED USING THE PROTECTION FENCING CONSISTENT WITH THE DETAIL ON THE BACK OF THE TREE DECLARATION PAGE WHILE WORK IS UNDERWAY. ALL WORKS MUST BE KEPT OUTSIDE OF THE MINIMUM PROTECTION ZONE(MPZ) FOR ALL TREES. ANY WORKS WITHIN THE MPZ COUNT AS INJURY. DESTRUCTION/INJURY TO TREE GREATER THAN OR EQUAL TO 20CM DBH WITHOUT A PERMIT WOULD BE A CONTRAVENTION OF THE BY-LAW AND MAY RESULT IN CHARGES BEING LAID.
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**SITE GRADING PLAN
- SINGLE RESIDENTIAL**

LOT AREA:	1,928.3 sq.m
PROPOSED HSE:	372.1 sq.m
LOT COVERAGE:	19.3 %

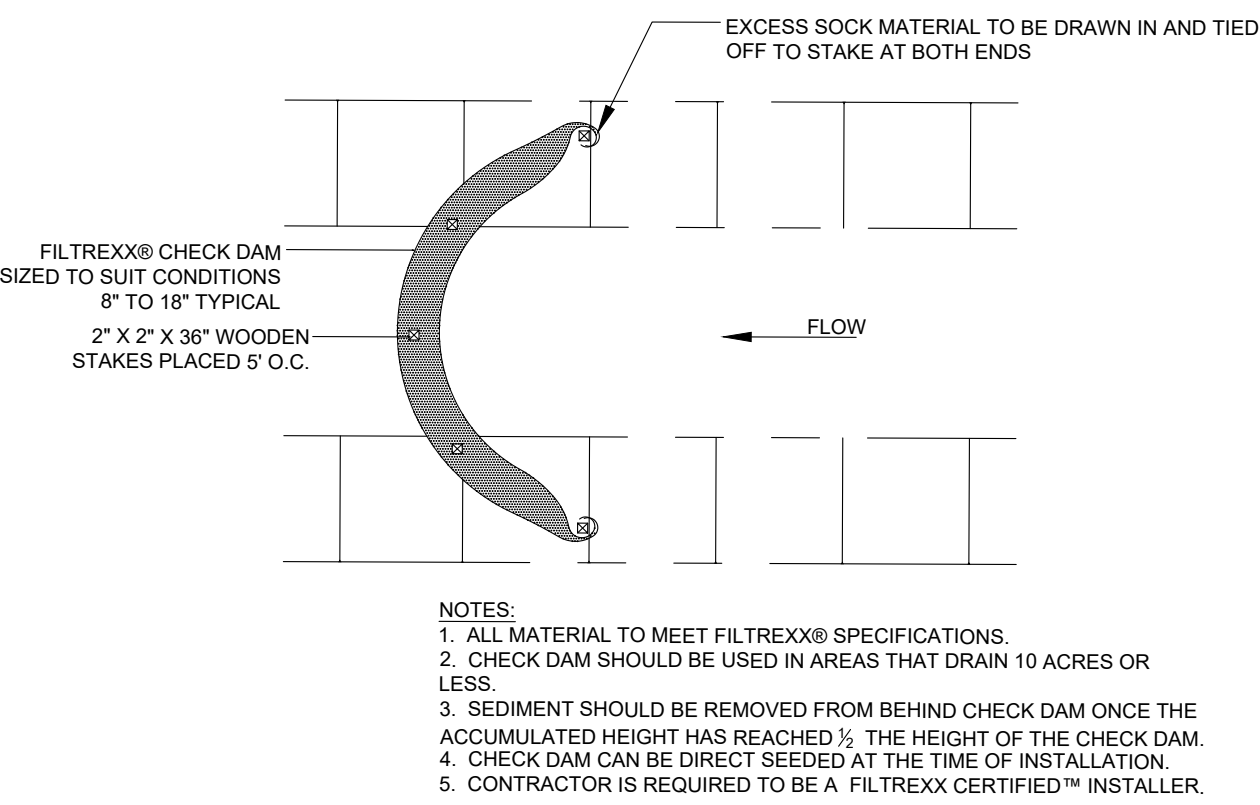
HOUSE ELEVATIONS:
FFF = 310.74
TFW = 310.38
BS = 306.80
USF = 305.30

FFF: FINISHED FIRST FLOOR
TFW: TOP OF FDN WALL
BS: BASEMENT SLAB
USF: UNDERSIDE OF FOOTING

NOTE: CONTRACTOR SHALL VERIFY BUILDING ELEVATIONS WITH ARCHITECTURAL DRAWINGS BEFORE FOUNDATION WORKS.

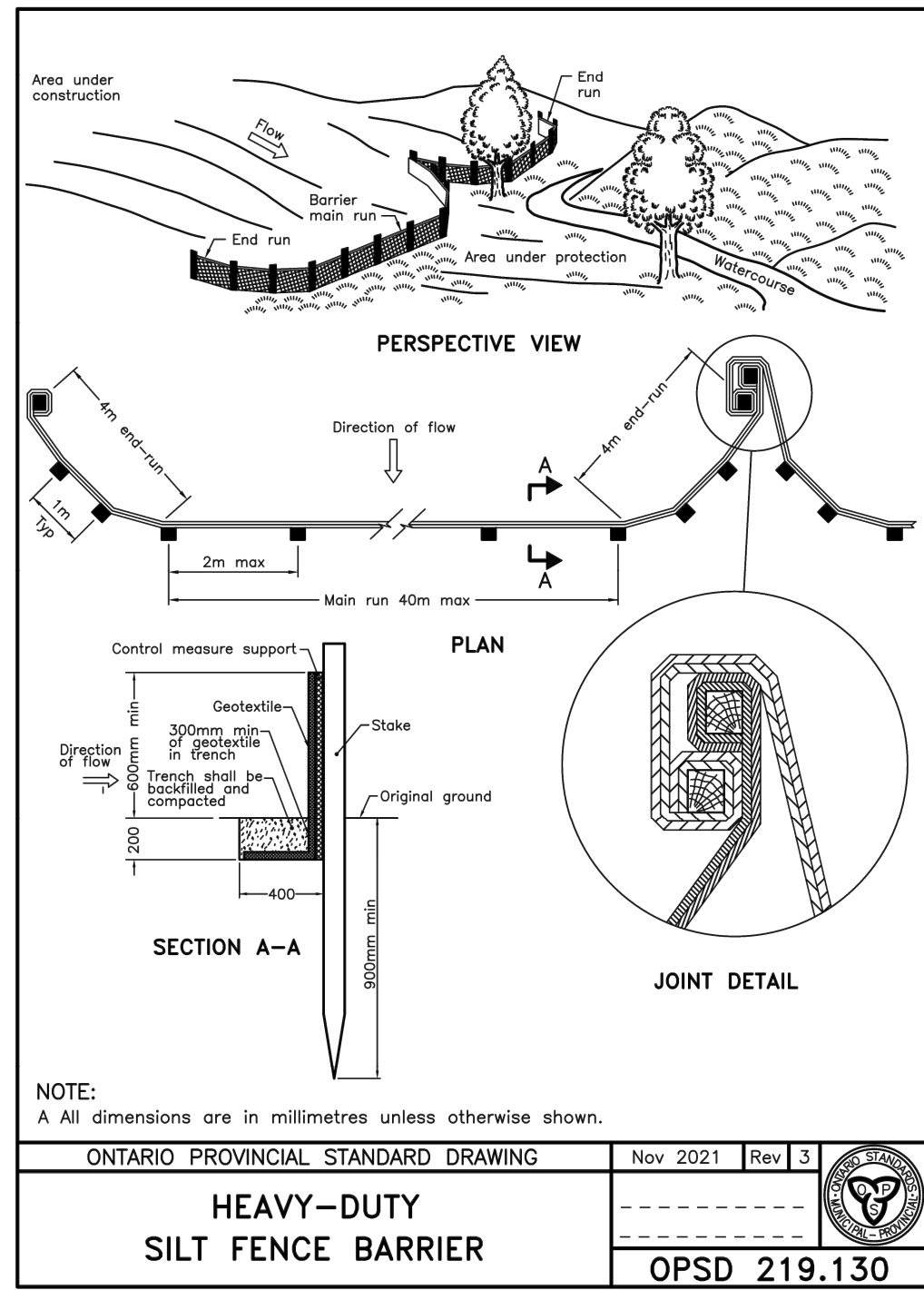
GENERAL NOTES - EROSION & SEDIMENT CONTROL:

1. VEGETATION OF THE SITE TO BE APPLIED AS PER OPS 804 IMMEDIATELY AFTER COMPLETION OF GRADING.
2. INSPECT SEDIMENT CONTROL DEVICES AFTER RAINFALL EVENTS (13mm OR GREATER) AND AT LEAST BI-WEEKLY.
3. INSTALLATION AND MAINTENANCE OF SILT FENCES AROUND THE PERIMETER OF THE SITE SHALL BE MAINTAINED FOR THE DURATION OF THE CONSTRUCTION PERIOD. SILT FENCE WILL BE AS PER OPSD 219.130.
4. NO CONSTRUCTION ACTIVITY OR MACHINERY TO OPERATE OUTSIDE THE SILT FENCING.
5. SILT FENCE WILL BE REMOVED ONLY AFTER SITE HAS BEEN STABILIZED AND RESTORATION OPERATIONS ARE COMPLETED.
6. THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING ALL ESC MEASURES IN WORKING CONDITIONS AT ALL TIMES TO THE SATISFACTION OF THE CONSULTING ENGINEER.
7. ALL CONSTRUCTION VEHICLES MUST ENTER AND EXIT THE SITE VIA MUD MAT AS SHOWN ON ESC PLAN.
8. EROSION CONTROL FENCING TO BE INSTALLED AROUND THE SLOPE.
9. NO ALTERNATE METHODS OF EROSION PROTECTION SHALL BE PERMITTED UNLESS APPROVED BY THE CONSULTING ENGINEER AND THE MUNICIPALITY OR CONSERVATION AUTHORITY.

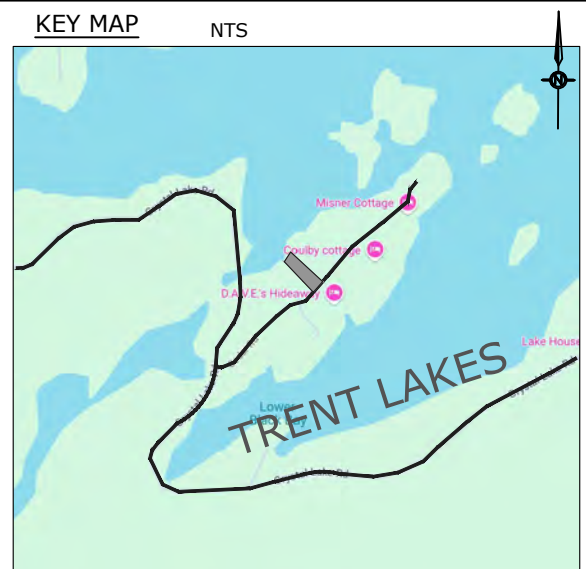


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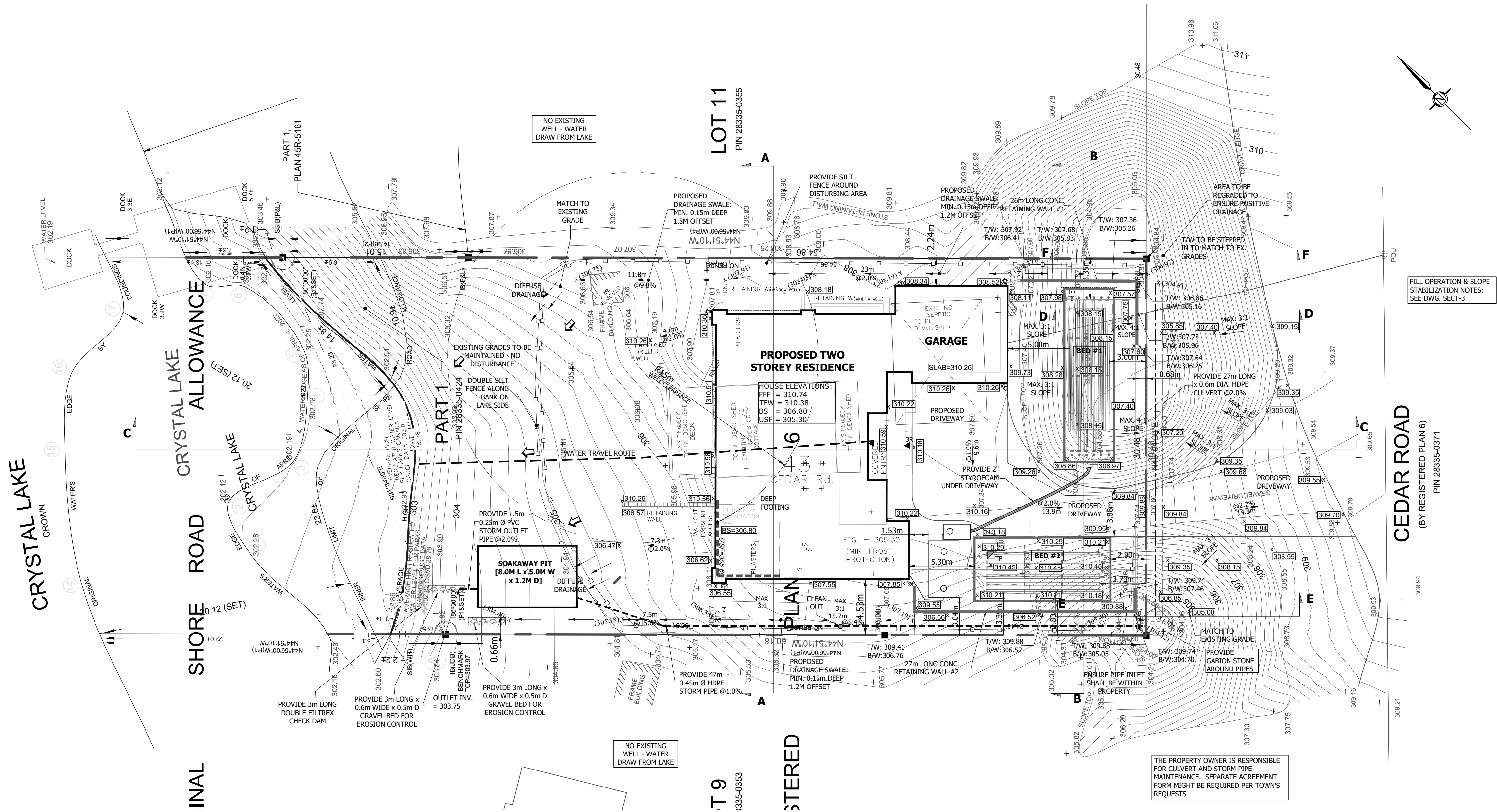


ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2021	Rev 3	
HEAVY-DUTY SILT FENCE BARRIER			
OPSD 219.130			



LEGEND

- x 307.10
x 304.97 EXISTING ELEVATIONS
- 308.20 PROPOSED ELEVATIONS
- SWALE DIRECTIONS
- SURFACE DRAINAGE DIRECTIONS
- ROOF DOWNSPOUT
- SILT FENCE
- 3.3m TREE TO BE REMOVED



REV.5-MAY 2026: GRADING AMENDED

RESIDENCE
LOT 10, PLAN 6
43 CEDAR ROAD
MUNICIPALITY OF TRENT LAKES

**SITE GRADING PLAN
- SINGLE RESIDENTIAL**

BJH Engineering Ltd.
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www.bjhengineering.ca

PROJECT NO.: **24-2181**
DRAWING NO.: **GP-1**

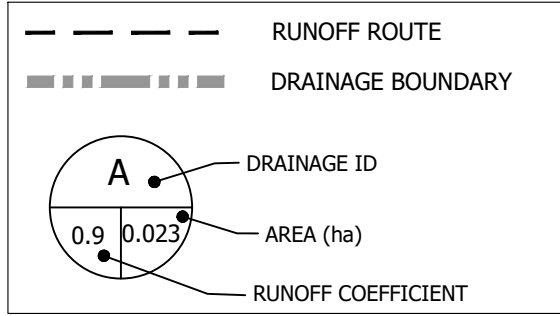
Date: APR 2024
Scale: 1 : 200
Designed By: BH
Drawn By: BH

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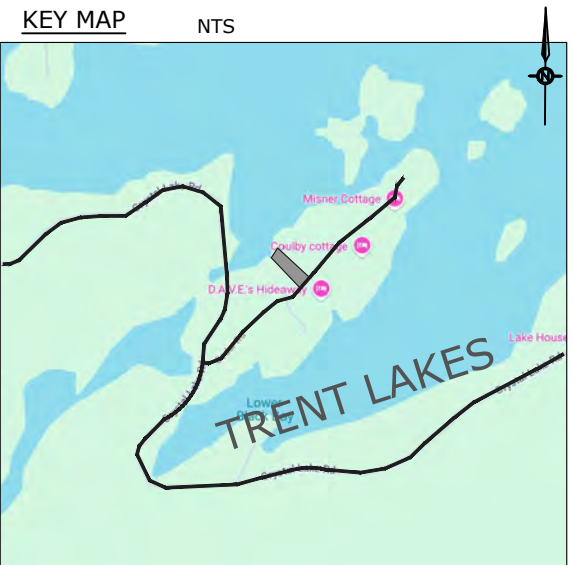
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STORMWATER
MANAGEMENT PLAN
- SINGLE RESIDENTIAL



PRE-DEVELOPMENT: TIME OF CONCENTRATION	
WEIGHTED RUNOFF COEFFICIENT	0.49
MAX. LENGTH OF WATER TRAVEL	36 m
SURFACE SLOPE	12.8%
Tc (TIME OF CONCENTRATION)	1.3 min.
NOTE: USE 15 min. FOR CALCULATIONS	

STORMWATER CATCHMENT AREA			
PRE-DEVELOPMENT: STM CATCHMENT AREA: 6,579 SQ.M (0.6579 ha)			
DRAINAGE ID	LANDUSE	AREA (SQ. M)	C (RUNOFF COEFFICIENT)
A	GRASS AREA	4,605	0.35
B	GRAVEL ROAD BUILDINGS	1,974	0.8
ASSUMPTION: 30% FOR EX. BLDGS AND GRAVEL ROAD			



- LEGEND
- x 307.10 EXISTING ELEVATIONS
 - x 304.97 SWALE ELEVATIONS
 - 508.20 PROPOSED ELEVATIONS
 - SWALE DIRECTIONS
 - SURFACE DRAINAGE DIRECTIONS
 - ROOF DOWNSPOUT
 - SILT FENCE
 - 0.30m TREE TO BE REMOVED



RESIDENCE
LOT 10, PLAN 6
43 CEDAR ROAD
MUNICIPALITY OF TRENT
LAKES

STOMWATER MANAGEMENT
PLAN: PRE-DEVELOPMENT

BJH
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PROJECT NO.: **24-2181**
DRAWING NO.: **STM-1**

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STORMWATER
MANAGEMENT PLAN
- SINGLE RESIDENTIAL

PROPOSED STM DRAIN PIPE CAPACITY ANALYSIS:

DEVELOPMENT: SINGLE RESIDENTIAL BUILDING
DRIVEWAY AND ACCESS ROAD EXTENSION

PEAK FLOW @100 YR. STORM EVENT INCREASED BY THE NEW DEVELOPMENT
6,579 SQ.M OF DRAINAGE AREA

POST DEV. PEAK FLOW IN 100 YR STORM EVENT:
 $Q = 0.1538 \text{ CUB.M / SEC}$

PROVIDE HDPE CULVERT CAPACITY:

$$Q = \frac{1}{n} [A R^{\frac{49}{148}} S^{\frac{49}{148}}]$$

WHERE, n = ROUGHNESS COEFFICIENT

A = SECTIONAL AREA

R = HYDRAULIC RADIUS

S = SLOPE OF ENERGY GRADIENT

300mm DIAMETER PVC STORM PIPE CAPACITY
@80% FULL (240mm FROM THE TOP OF PIPE)
n (PVC OR PE) = 0.007
SLOPE OF PIPE = 1.0%

$$Q = 0.1754 \text{ CUB.M / SEC}$$

$$V = 3.21 \text{ m/sec}$$

SOAKAWAY PIT: INSPECTION AND MAINTENANCE

- MAINTENANCE TYPICALLY CONSISTS OF CLEANING OUT LEAVES, DEBRIS AND ACCUMULATED SEDIMENT CAUGHT IN PRETREATMENT DEVICES, INLETS AND OUTLETS ANNUALLY OR AS NEEDED.

- INSPECTION VIA AN MONITORING WELL SHOULD BE PERFORMED TO ENSURE THE FACILITY DRAINS WITHIN THE MAXIMUM ACCEPTABLE LENGTH OF TIME (TYPICALLY 72 HOURS) AT LEAST ANNUALLY AND FOLLOWING EVERY MAJOR STORM EVENT (>25 MM).

- IF THE TIME REQUIRED TO FULLY DRAIN EXCEEDS 72 HOURS, DRAIN VIA PUMPING AND CLEAN OUT THE PERFORATED PIPE UNDERDRAIN, IF PRESENT.
IF SLOW DRAINAGE PERSISTS, THE SYSTEM MAY NEED REMOVAL AND REPLACEMENT OF GRANULAR MATERIAL AND/OR GEOTEXTILE FABRIC.

EXISTING BUILDING = 72 m²
PROPOSED BUILDING = 372 m²
IMPERVIOUS AREAS:
BUILDING: 372 m²
DRIVEWAY: 124 m²
TOTAL: 496 m²

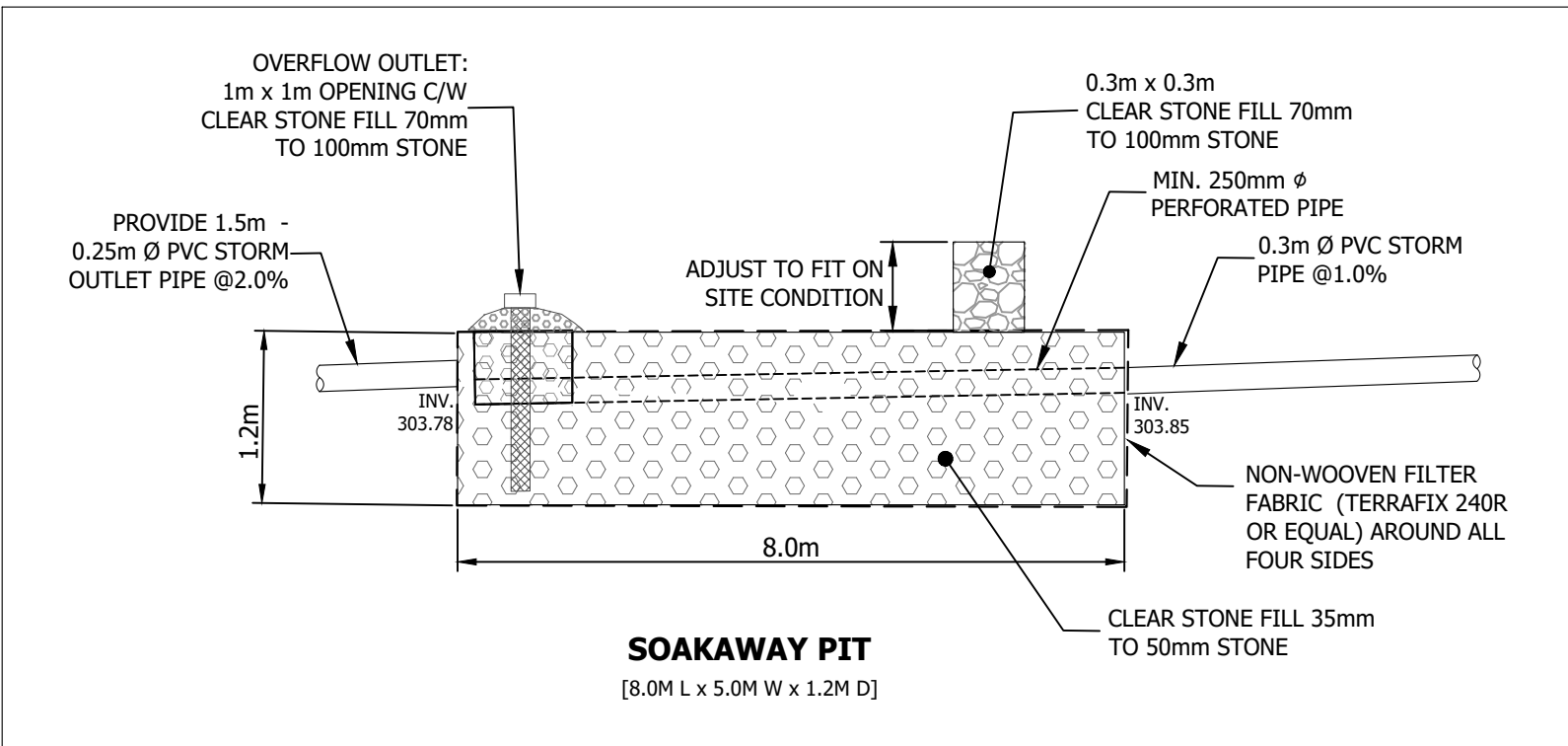
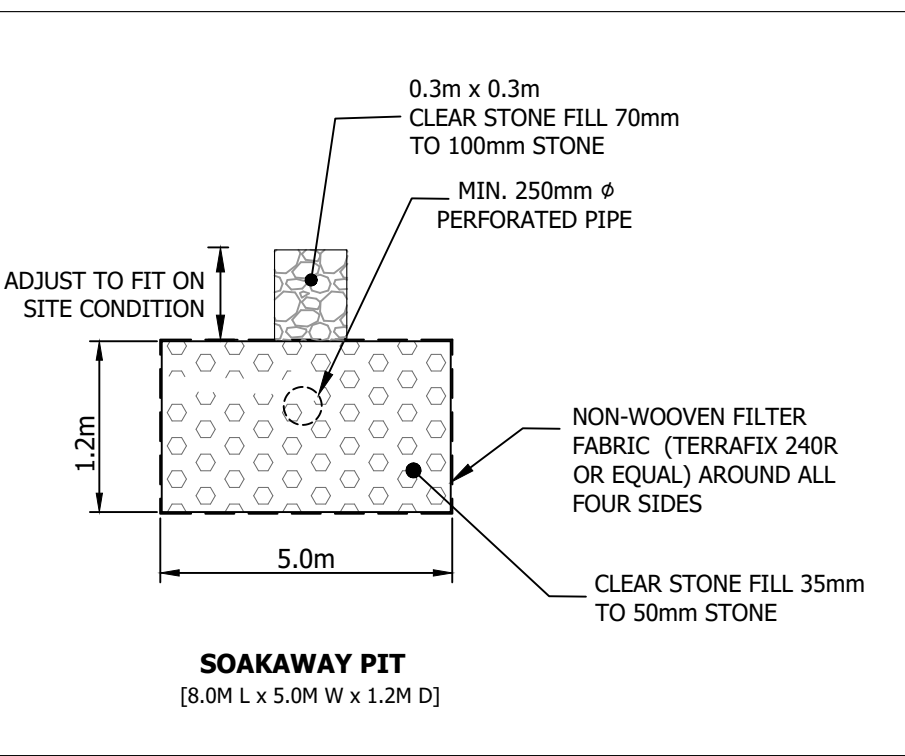
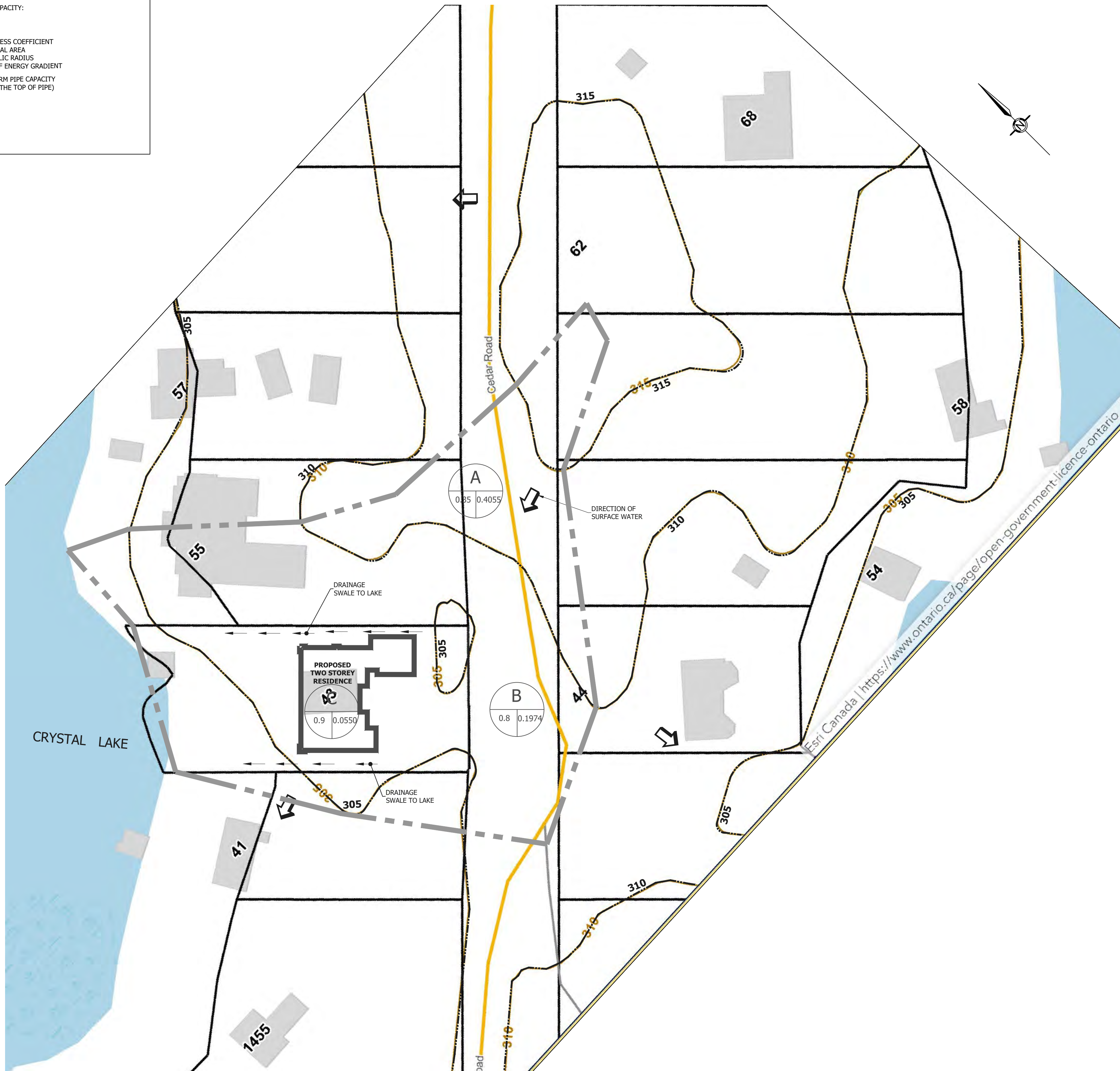
STORAGE VOLUME:
- MAXIMUM TARGET STORAGE VOLUME = 25 mm
OVER IMPERVIOUS AREA OF 496 m²

SOIL PERCOLATION TIME
SOIL TYPE: SM (SILTY SAND)
PERCOLATION TIME = 12min/cm
PERCOLATION RATE = 50 mm/hr

STORAGE VOLUME REQUIRED:
MAX. TARGET: [496 m² x 0.025m] = 12.4 CUB.M

STORAGE VOLUME PROVIDED:
8.0m L x 5.0m W x 1.2m D

VOL. PROVIDED = 14.4 CUB.M



POST-DEVELOPMENT: TIME OF CONCENTRATION

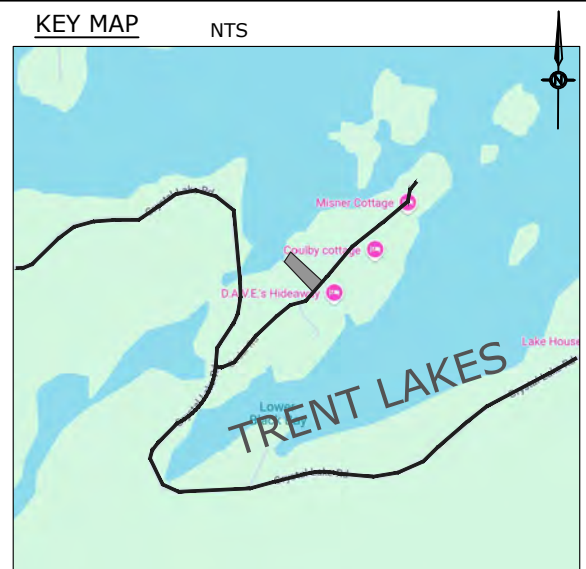
WEIGHTED RUNOFF COEFFICIENT	0.53
MAX. LENGTH OF WATER TRAVEL	36 m
SURFACE SLOPE	12.8%
Tc (TIME OF CONCENTRATION)	1.2 min.

NOTE: USE 15 min. FOR CALCULATIONS

STORMWATER CATCHMENT AREA

POST-DEVELOPMENT:
STM CATCHMENT AREA: 6,579 SQ.M (0.6579 ha)

DRAINAGE ID	LANDUSE	AREA (SQ. M)	C (RUNOFF COEFFICIENT)
A	GRASS AREA	4,055	0.35
B	BUILDINGS	1,974	0.8
C	BUILDING ROAD (ASPHALT)	550	0.9



LEGEND

- EXISTING ELEVATIONS
- SWALE ELEVATIONS
- PROPOSED ELEVATIONS
- SWALE DIRECTIONS
- SURFACE DRAINAGE DIRECTIONS
- ROOF DOWNSPOUT
- SILT FENCE
- TREE TO BE REMOVED



RESIDENCE

LOT 10, PLAN 6
43 CEDAR ROAD
MUNICIPALITY OF TRENT LAKES

STOMWATER MANAGEMENT
PLAN: POST-DEVELOPMENT

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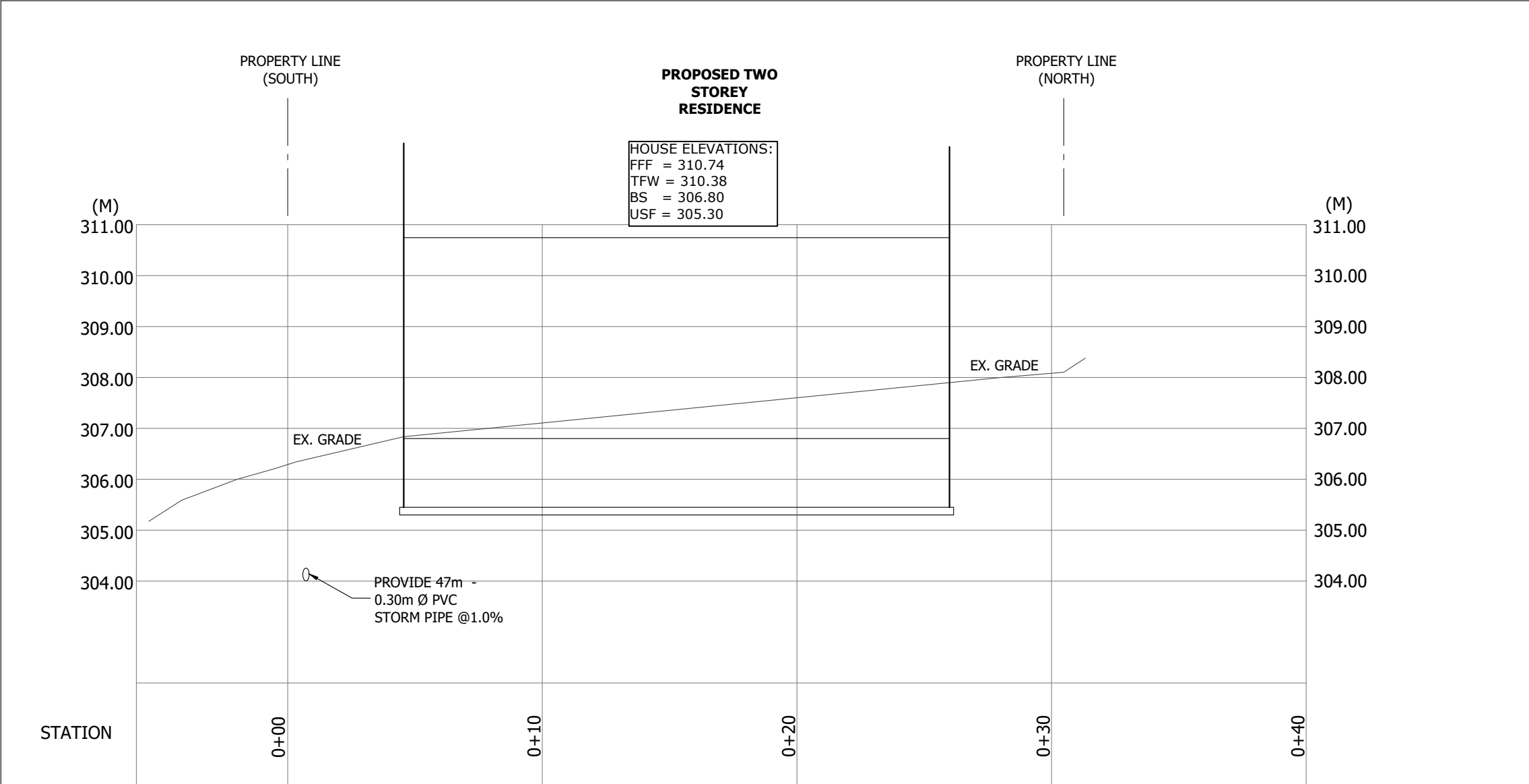
DRAWING NO.: STM-2

Date: AUG 2025

Designed By: BH

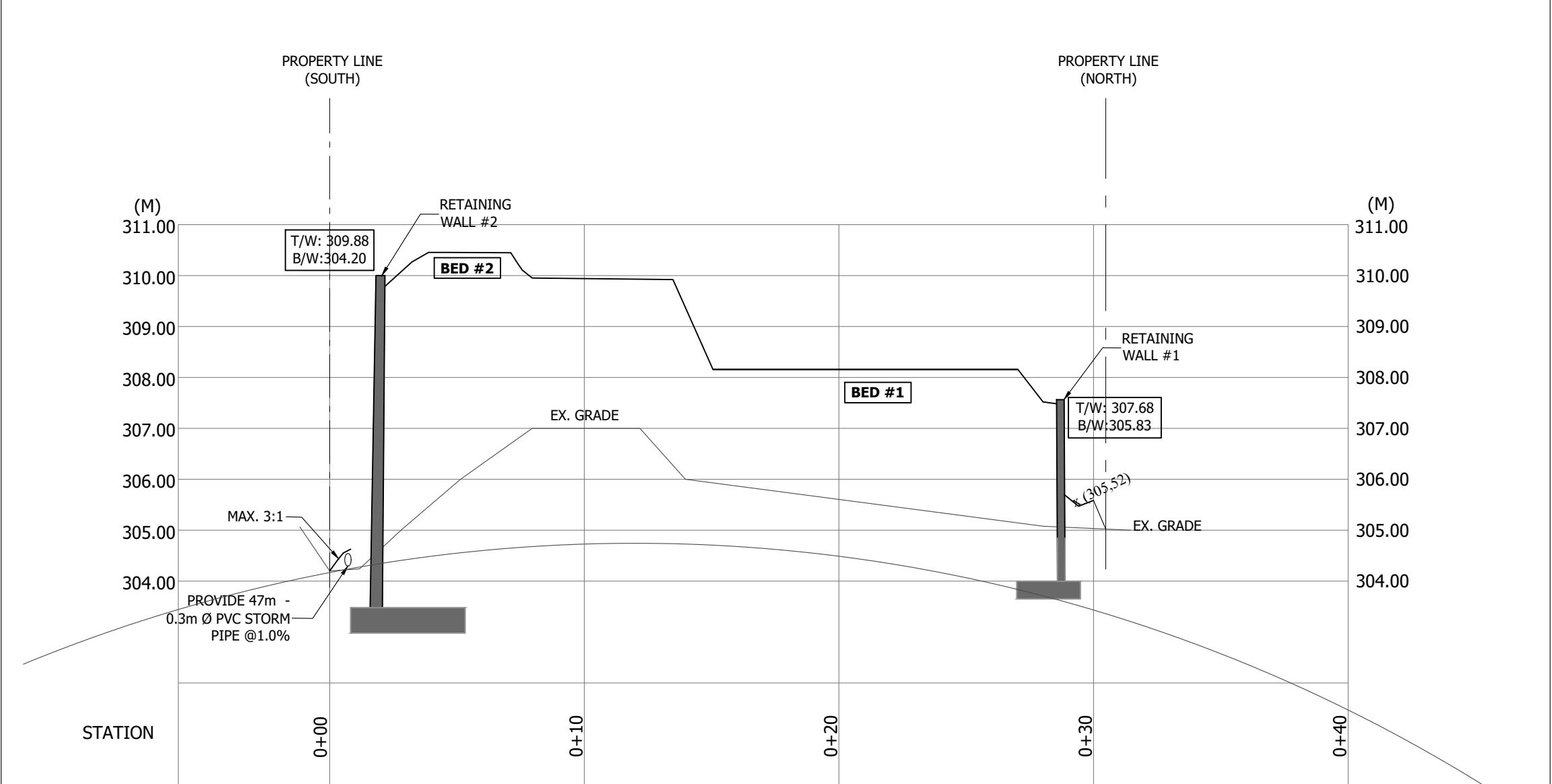
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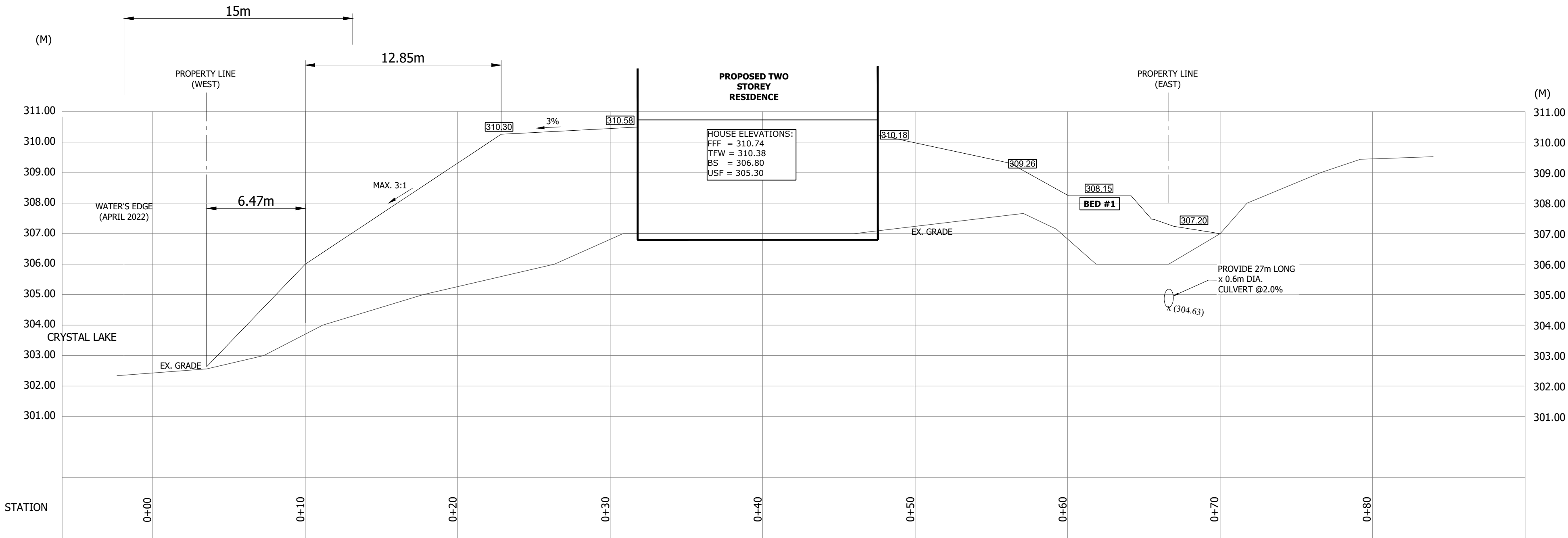
SECTION 'A-A'

SCALE
HOR. 1 : 200
VERT. 1: 100



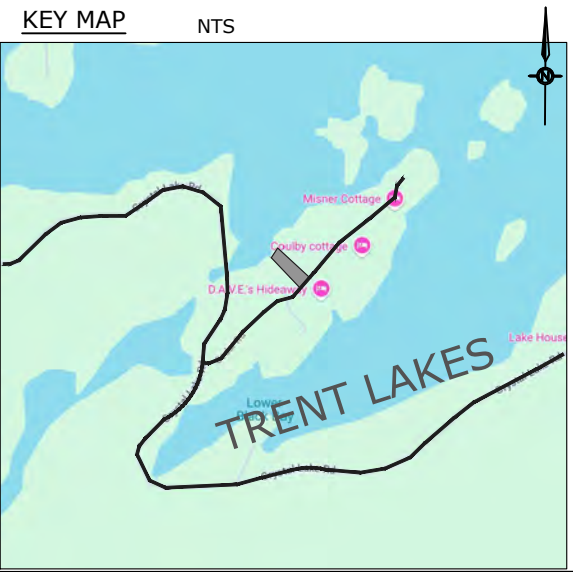
SECTION 'B-B'

SCALE
HOR. 1 : 200
VERT. 1: 100



SECTION 'C-C'

SCALE
HOR. 1 : 200
VERT. 1: 100



REV.2-FEB 2026: GENERAL REVISION

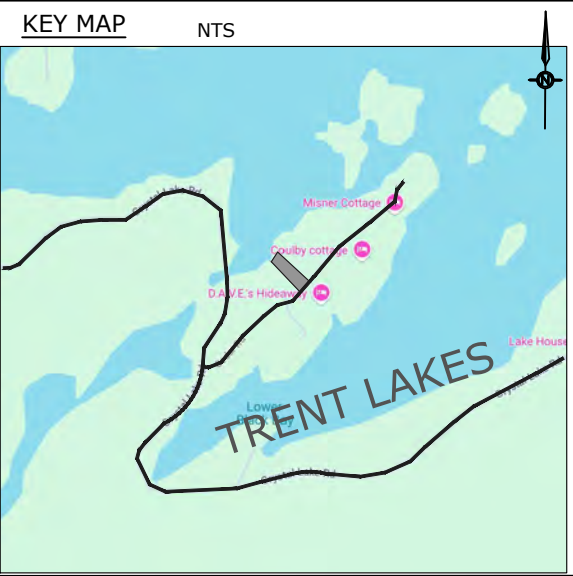
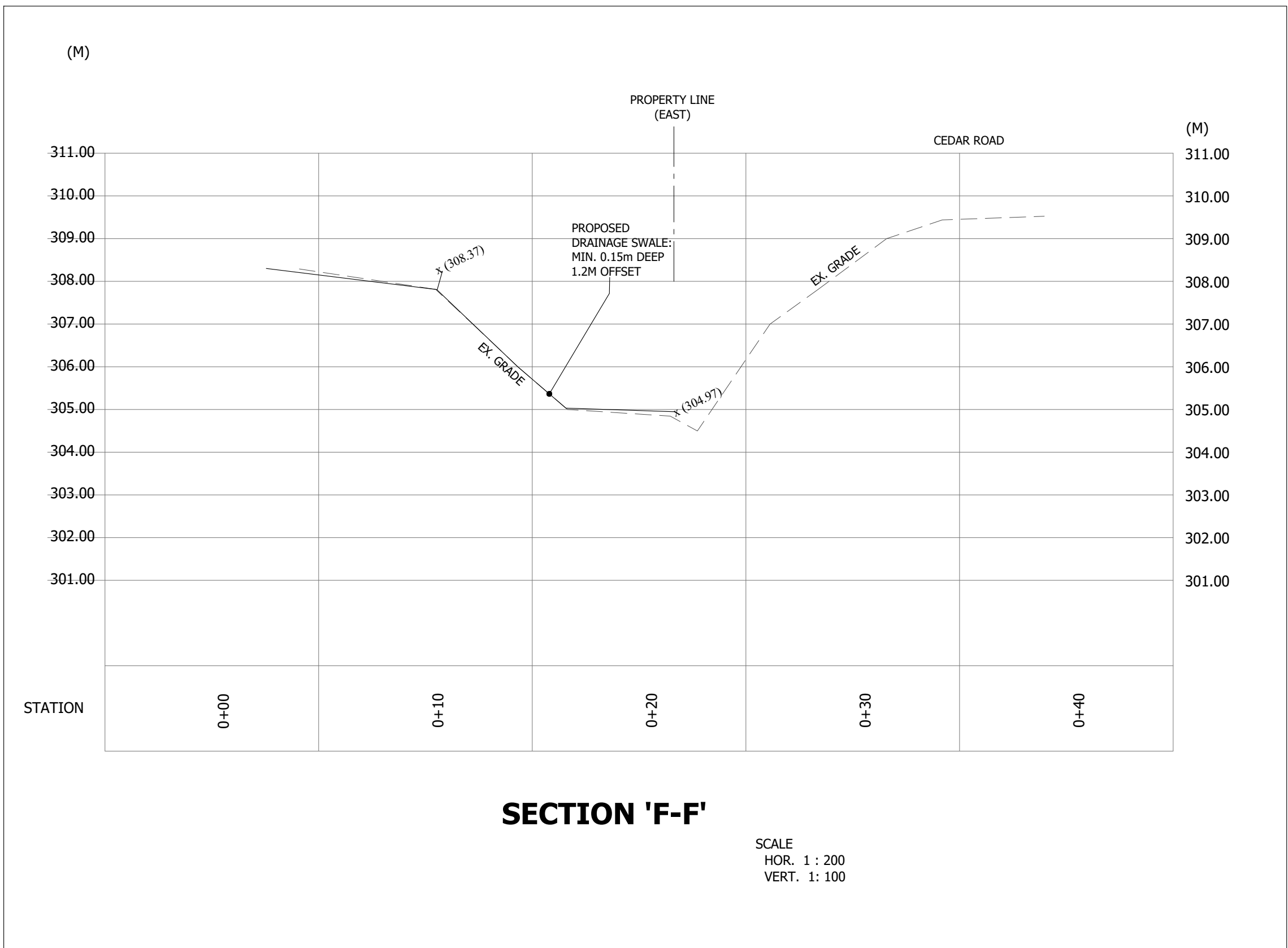
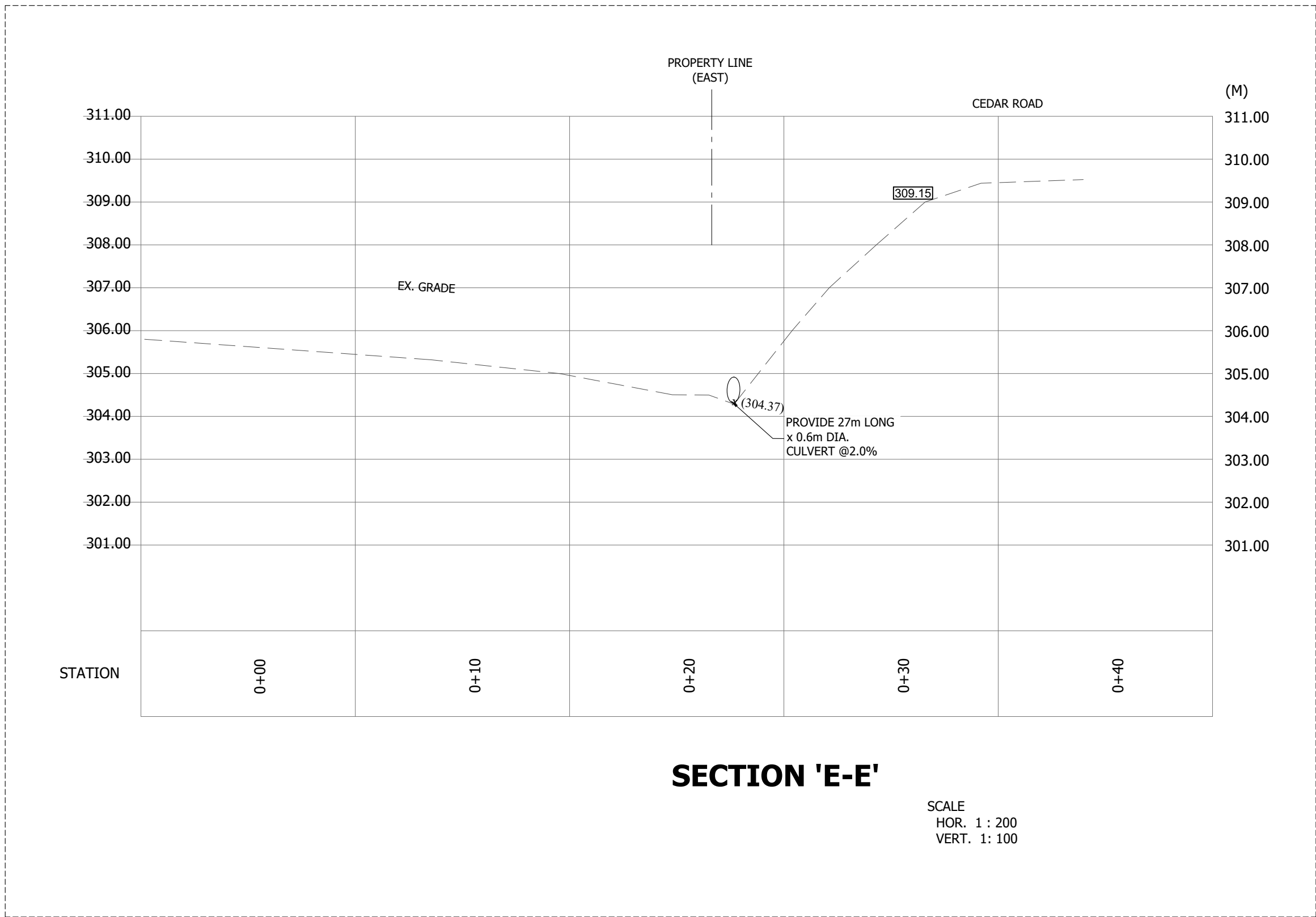
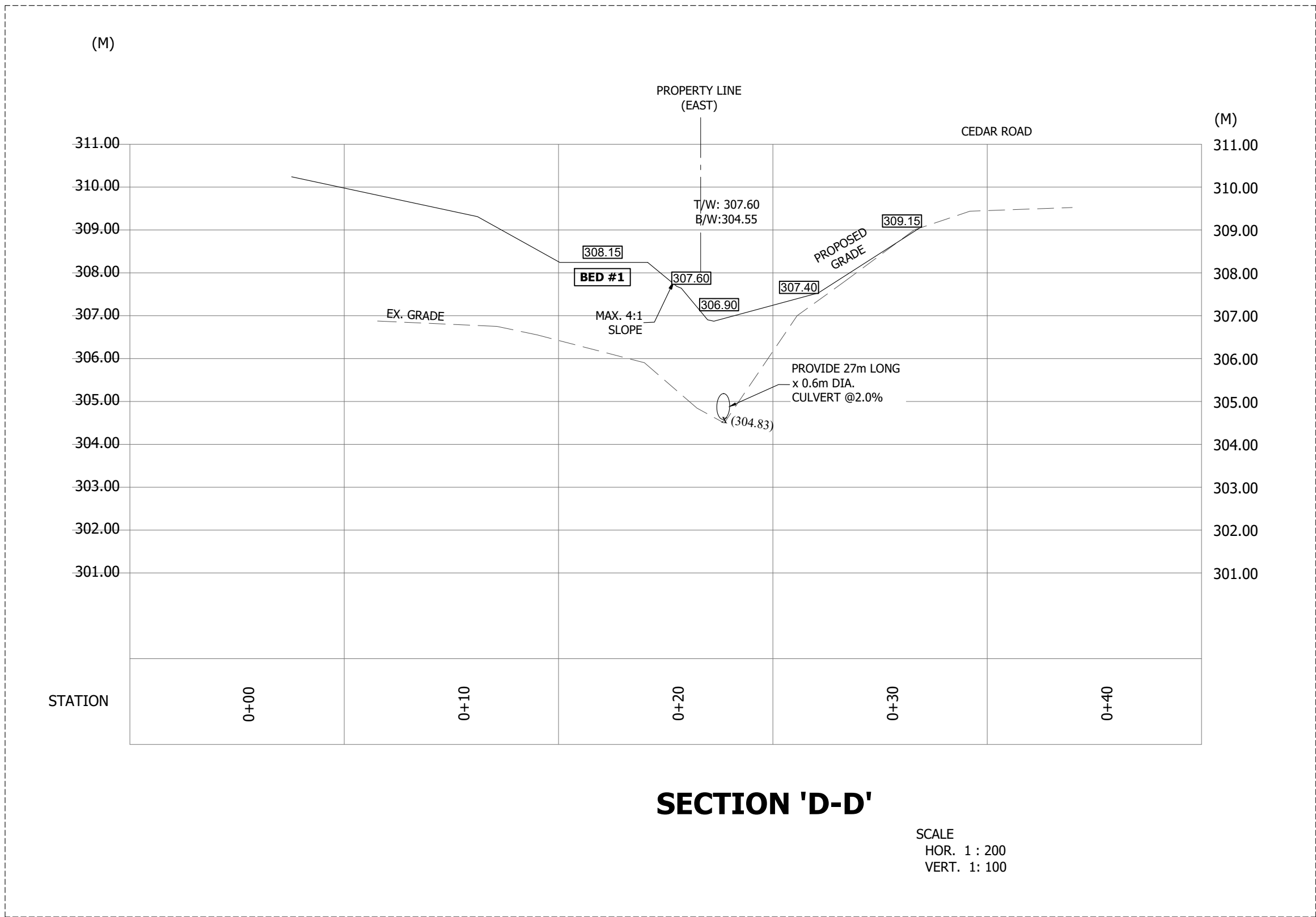
RESIDENCE
LOT 10, PLAN 6
43 CEDAR ROAD
MUNICIPALITY OF TRENT
LAKES

CROSS-SECTIONS

BJH
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PROJECT NO.: **24-2181**
DRAWING NO.: **SECT-1**

Date: APR 2025
Scale: AS SHOWN
Designed By: BH
Drawn By: BH



REV.2-FEB 2026: GENERAL REVISION

RESIDENCE

LOT 10, PLAN 6
43 CEDAR ROAD
MUNICIPALITY OF TRENT
LAKES

SECTION D-D, E-E, & F-F



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PROJECT NO.: **24-2181**

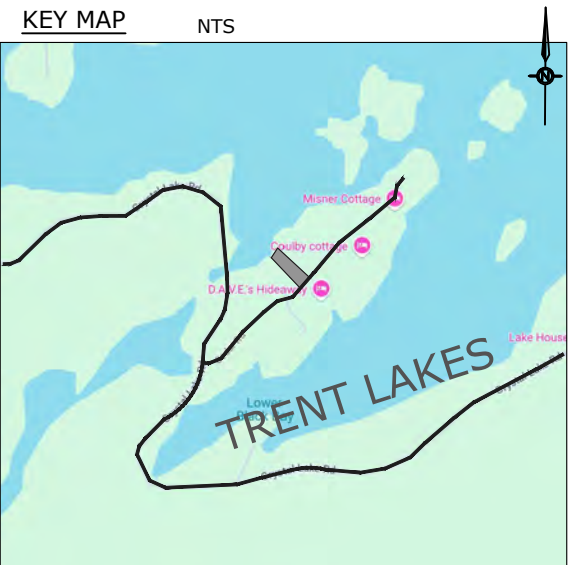
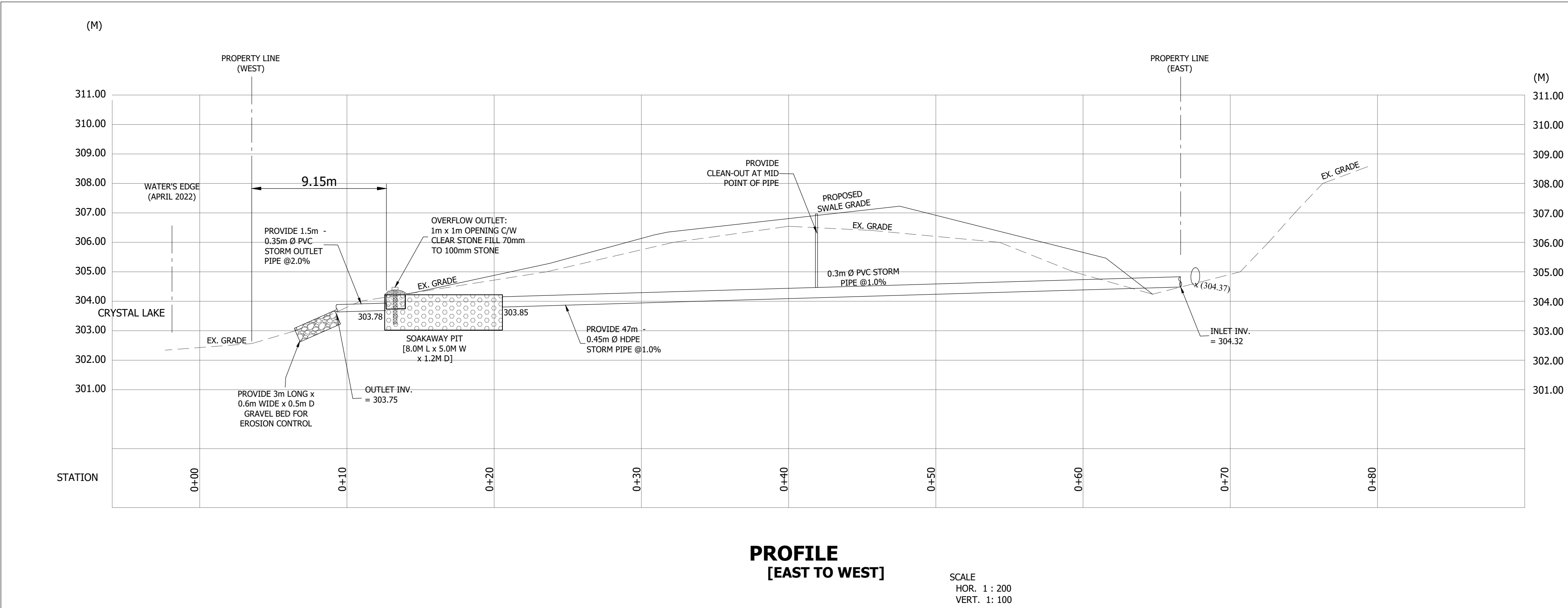
DRAWING NO.: **SECT-2**

Date: APR 2025

Designed By: BH

Scale: AS SHOWN

Drawn By: BH



OPERATIONAL STANDARDS:

THE FOLLOWING ARE PROPOSED STANDARDS FOR THE MAINTENANCE AND OPERATION OF THE FILL AREA:

1. SITE PERSONNEL WILL RECEIVE SPECIALIZED TRAINING FOR THEIR SPECIFIC WORK TASKS.
2. THE PLACEMENT OF CLEAN FILL MATERIAL AT THE SITE WILL BE ADEQUATELY AND CONTINUALLY SUPERVISED.
3. CLEAN MATERIAL WILL BE PLACED IN AN ORDERLY MANNER AT THE FILL AREA.
4. PROCEDURES WILL BE ESTABLISHED, SIGNS POSTED, AND SAFEGUARDS MAINTAINED FOR THE PREVENTION OF ON-SITE ACCIDENTS.
5. VEHICULAR ACCESS TO THE PROPERTY WILL BE BY ROADWAY CLOSED BY A GATE CAPABLE OF BEING LOCKED.
6. ACCESS ROADS AND ON-SITE ROADS WILL BE PROVIDED SO THAT VEHICLES HAULING CLEAN MATERIAL TO AND ON THE SITE MAY TRAVEL READILY UNDER ALL NORMAL WEATHER CONDITIONS.
7. ACCESS TO THE SITE WILL BE LIMITED TO TIMES WHEN AN ATTENDANT IS ON DUTY AND ACCESSIBLE ONLY TO PERSONS AUTHORIZED TO DEPOSIT CLEAN MATERIAL AT THE FILL AREA.
8. DRAINAGE PASSING OVER OR THROUGH THE SITE WILL NOT ADVERSELY AFFECT ADJOINING PROPERTIES. NATURAL DRAINAGE WILL NOT BE OBSTRUCTED.
9. CLEAN FILL MATERIAL WILL BE PLACED IN SUCH MANNER THAT GROUNDWATER AQUIFERS WILL NOT BE IMPAIRED.
10. IF GROUNDWATER CONTAMINATION IN EXCESS OF ONTARIO REGULATION 153/04 IS ENCOUNTERED, ACTION WILL BE TAKEN TO ISOLATE THE SOURCE OF CONTAMINATION AND EFFECTIVELY PREVENT THE EGRESS OF CONTAMINANTS FROM THE SITE.
11. WHERE THERE IS A POSSIBILITY OF GROUNDWATER POLLUTION RESULTING FROM THE OPERATION OF THE FILL AREA, SAMPLES WILL BE TAKEN AND TESTS MADE BY THE OWNER OF THE SITE TO MEASURE THE EXTENT OF CONTAMINATION AND, IF NECESSARY, MEASURES WILL BE TAKEN FOR THE COLLECTION AND TREATMENT OF CONTAMINANTS AND FOR THE PREVENTION OF GROUNDWATER POLLUTION
12. WHEN THE FILL AREA HAS REACHED ITS LIMIT OF FILL, A FINAL COVER OF SOIL WILL BE DESIGNED AND CONSTRUCTED TO A GRADE CAPABLE OF SUPPORTING VEGETATION AND THAT MINIMIZES EROSION. ALL SLOPES WILL BE DESIGNED TO DRAIN RUNOFF AWAY FROM THE COVER AND TO PREVENT WATER FROM PONDING. NO STANDING WATER WILL BE ALLOWED ANYWHERE IN OR ON THE COMPLETED FILL AREA. THE FILL AREA WILL THEN BE SEEDED WITH VEGETATION TO MINIMIZE WIND AND WATER EROSION. THE VEGETATION USED WILL BE COMPATIBLE WITH I.E. GROW AND SURVIVE UNDER THE LOCAL CLIMATIC CONDITIONS AND WILL INCLUDE OF A DIVERSE MIX OF NATIVE AND INTRODUCED SPECIES CONSISTENT WITH THE POST CLOSURE LAND USE. TEMPORARY EROSION CONTROL MEASURES WILL BE UNDERTAKEN WHILE VEGETATION IS BEING ESTABLISHED

FILL SCREENING PROCEDURES:

THE INITIAL INSPECTION OF THE TRUCK AND ITS LOAD OF INERT FILL WILL INCLUDE A REVIEW OF THE CHAIN OF CUSTODY PROVIDED BY THE TRANSPORTER AND A VISUAL INSPECTION OF THE FILL FOR SIGNS OF CONTAMINATION. IF AT ANY POINT DURING THE VISUAL INSPECTION THERE IS EVIDENCE THAT THE FILL MAY BE CONTAMINATED IT WILL BE REJECTED.

THE ATTACHED FILL INSPECTION CHECKLIST WILL BE USED TO RECORD AND DOCUMENT THE CHAIN OF CUSTODY AND ALL INITIAL AND SECONDARY INSPECTIONS.

THE FIRST PROCEDURE FOR THE SITE INSPECTOR WILL BE TO RECORD THE LOAD NUMBER, TRUCK NUMBER, THE NAME OF THE COMPANY HAULING THE FILL, THE DRIVER'S NAME AND ENSURE THAT THE TRANSPORTER PROVIDES A CHAIN OF CUSTODY (REFER TO CHECK LIST).
THE CHAIN OF CUSTODY WILL INCLUDE A RECORD FOR THE FILL BEING DELIVERED FROM ITS PLACE OF ORIGIN TO THE SITE.

THE CHAIN OF CUSTODY WILL INCLUDE INFORMATION CONCERNING THE INERT FILL, THE TRANSPORT OF THE INERT FILL, AND THE TRUCK ITSELF. INFORMATION PERTAINING TO THE INERT FILL SHOULD INCLUDE: PLACE OF ORIGIN; SOIL CONSTITUENTS; PROOF THAT THE FILL IS CLEAN; AND COPIES OF ANALYSES TO PROVIDE EVIDENCE THAT THE SOIL IS NOT CONTAMINATED. RECORDS PERTAINING TO THE TRANSPORT SHOULD INCLUDE: A LIST OF ALL DRIVERS INVOLVED IN THE HAULAGE OF THE INERT FILL FROM ITS PLACE OF ORIGIN TO THE SITE; DOCUMENTATION OF ALL STOPS MADE FROM THE PLACE OF ORIGIN TO THE SITE; DOCUMENTATION THAT ENSURES THE TRUCK IS AT THE PROPER LOCATION, RECORDS OF TRANSPORT CLEANING AND SANITATION PROCEDURES FOR THE TRUCK AND LOADING EQUIPMENT SHOULD ALSO BE PROVIDED UPON REQUEST TO ENSURE THAT THE FILL HAS NOT BEEN CONTAMINATED BY PREVIOUSLY TRANSPORTED MATERIALS.

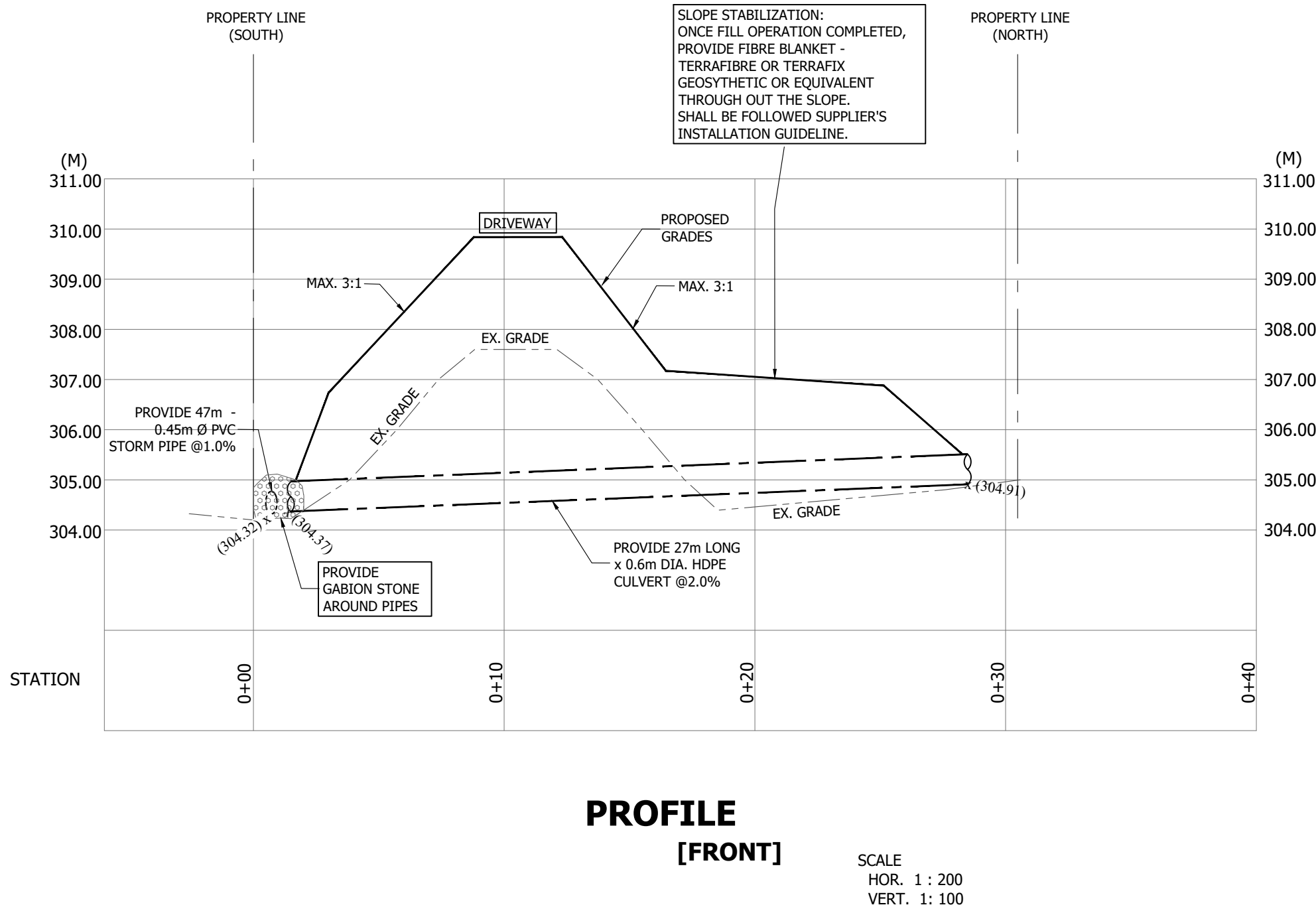
AN INITIAL VISUAL INSPECTION OF THE INERT FILL WILL OCCUR WHILE THE FILL IS STILL IN THE TRUCK AND, IF THE FILL IS DEEMED SATISFACTORY, A SECONDARY VISUAL INSPECTION WILL BE PERFORMED WHEN THE FILL IS BEING DUMPED IN THE DESIGNATED FILL AREA, BOTH INITIAL AND SECONDARY INSPECTIONS WILL INCLUDE A FIRSTHAND OBSERVATION OF THE FOLLOWING:

- ODOURS
- UNUSUAL CLUMPING
- HAZARDOUS MATERIALS (BIOMEDICAL, FLAMMABLE, ETC.)
- FOOD, HOUSEHOLD WASTE
- DISCOLOURATION
- VISCOSITY (LIQUID AND SLUDGE)
- PUTRESIBLE WASTES
- ANY OTHER UNAUTHORIZED MATERIALS

INITIAL AND SECONDARY INSPECTIONS WILL INCLUDE THE RAKING AND PROBING OF THE FILL IN ORDER TO AGITATE THE SOIL AND BRING UNDERLYING SOIL TO THE SURFACE SO THAT AN ACCURATE REPRESENTATION OF THE SOIL MAY BE INSPECTED.

IF THERE IS EVIDENCE THAT THE SOIL MAY BE CONTAMINATED THE SITE INSPECTOR WILL REJECT THE LOAD.

WHEN EITHER THE INITIAL OR SECONDARY INSPECTIONS PROVIDE EVIDENCE THAT THE SOIL IS NOT CLEAN THE TRUCKLOAD WILL BE REFUSED AND DIRECTED TO THE APPROPRIATE LICENSED WASTE DISPOSAL FACILITY. THE SITE SUPERVISOR WILL DOCUMENT WHAT WAS FOUND, WHY THE LOAD WAS REFUSED AND TO WHICH FACILITY THE LOAD WAS DIRECTED.



REV.3-MAR 2026: PROFILE & FILL OPERATION NOTES

RESIDENCE

LOT 10, PLAN 6
43 CEDAR ROAD
MUNICIPALITY OF TRENT LAKES

PROFILES



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PROJECT NO.: **24-2181**

DRAWING NO.: **SECT-3**

Date: FEB 2026

Designed By: BH

Scale: AS SHOWN

Drawn By: BH

RETAINING WALL DESIGN - CHBDC - STRUCTURAL

11 m LONG RETAINING WALL AT BED #1

PROJECT: 24-2181

LOCATION: 43 Cedar Road Municipality of Trent Lakes

7.3.2 Tension Reinforcement

Maximum Factored Moment at 1000 mm Above Footing	Mu =	33 kNm - Tension in Back Face
Area of Tension Steel	As =	666.6667 mm ² 15M @ 300 mm
Bar Diameter		15 mm
Cover		70 mm
Distance from extreme compression fibre to tension steel	d =	290 mm

7.3.3 Factored Flexural Resistance

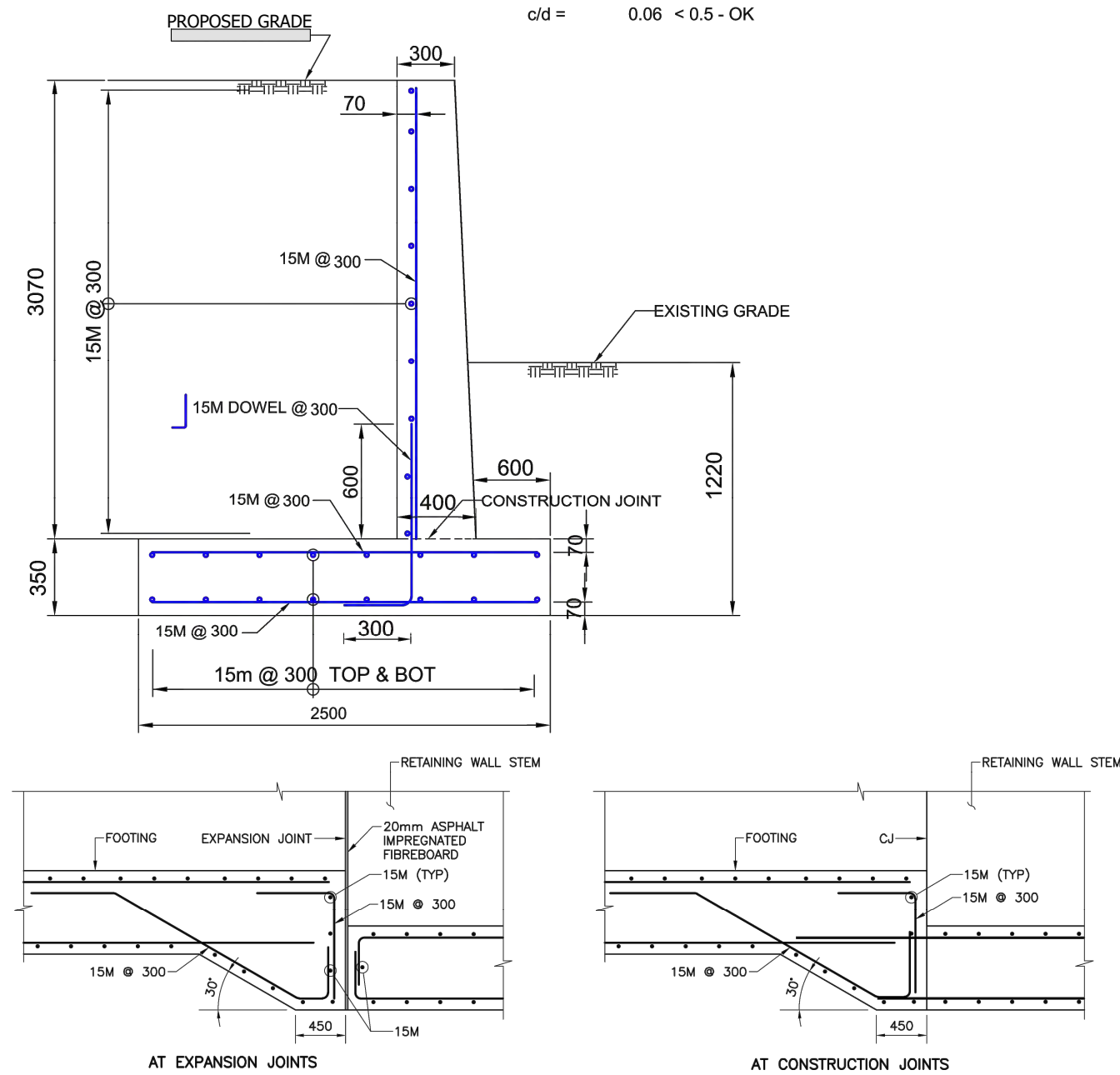
Strength Reduction Factor for Concrete	$\phi_c =$	0.75
Strength Reduction Factor for Reinforcing Steel	$\phi_s =$	0.90
	$\alpha_1 =$	0.813
	a =	18 mm
	M _r =	67 kNm > Mu = 33kNm - OK

7.3.4 Minimum Reinforcement

Cracking Moment	M _{cr} =	45 kNm
Check Mr > 1.2 M _{cr}	Mr =	67 kNm > 1.2M _{cr} = 54kNm - OK

7.3.5 Maximum Reinforcement

B / l =	0.908
c = B / l x a =	16 mm
c / d =	0.06 < 0.5 - OK



TYPICAL STEPPED FOOTING DETAIL

1:30

Surcharge - Structural

RETAINING WALL DESIGN - CHBDC - STRUCTURAL

20 m LONG RETAINING WALL AT BED #2

PROJECT: 24-2181

LOCATION: 43 Cedar Road Municipality of Trent Lakes

7.3.2 Tension Reinforcement

Maximum Factored Moment at 1600 mm Above Footing	Mu =	78 kNm - Tension in Back Face
Area of Tension Steel	As =	1333.3333 mm ² 15M @ 150 mm
Bar Diameter		15 mm
Cover		70 mm
Distance from extreme compression fibre to tension steel	d =	405 mm

7.3.3 Factored Flexural Resistance

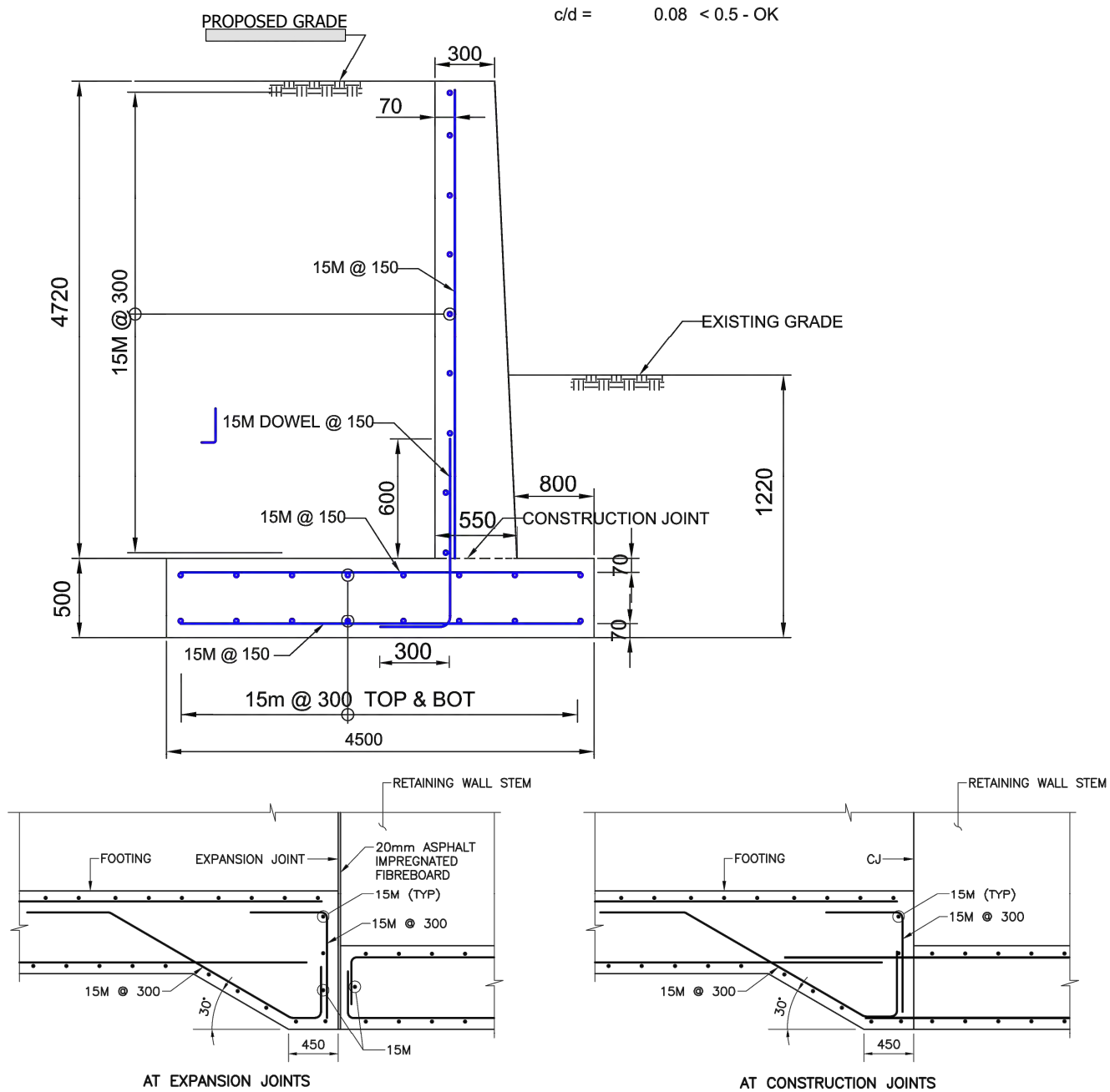
Strength Reduction Factor for Concrete	$\phi_c =$	0.75
Strength Reduction Factor for Reinforcing Steel	$\phi_s =$	0.90
	$\alpha_1 =$	0.813
	a =	36 mm
	M _r =	186 kNm > Mu = 78kNm - OK

7.3.4 Minimum Reinforcement

Cracking Moment	M _{cr} =	78 kNm
Check Mr > 1.2 M _{cr}	Mr =	186 kNm > 1.2M _{cr} = 93kNm - OK

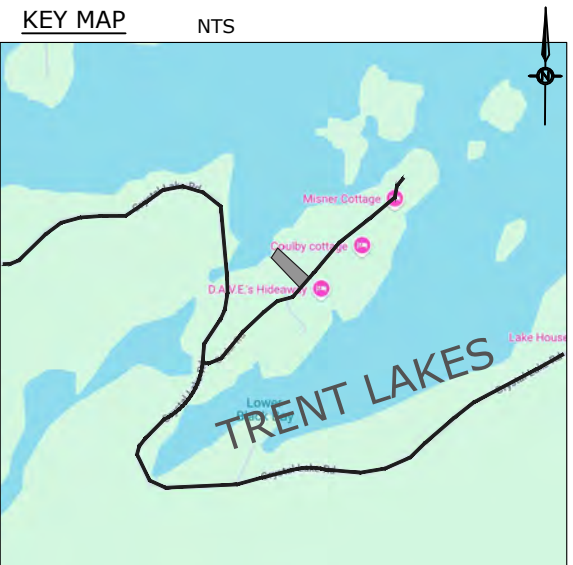
7.3.5 Maximum Reinforcement

B / l =	0.908
c = B / l x a =	33 mm
c / d =	0.08 < 0.5 - OK



TYPICAL STEPPED FOOTING DETAIL

1:30



RESIDENCE

LOT 10, PLAN 6
43 CEDAR ROAD
MUNICIPALITY OF TRENT
LAKES

RETAINING WALL



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PROJECT NO.: **24-2181**

DRAWING NO.: **RET-1**

Date: APR 2025

Designed By: BH

Scale: AS SHOWN

Drawn By: BH

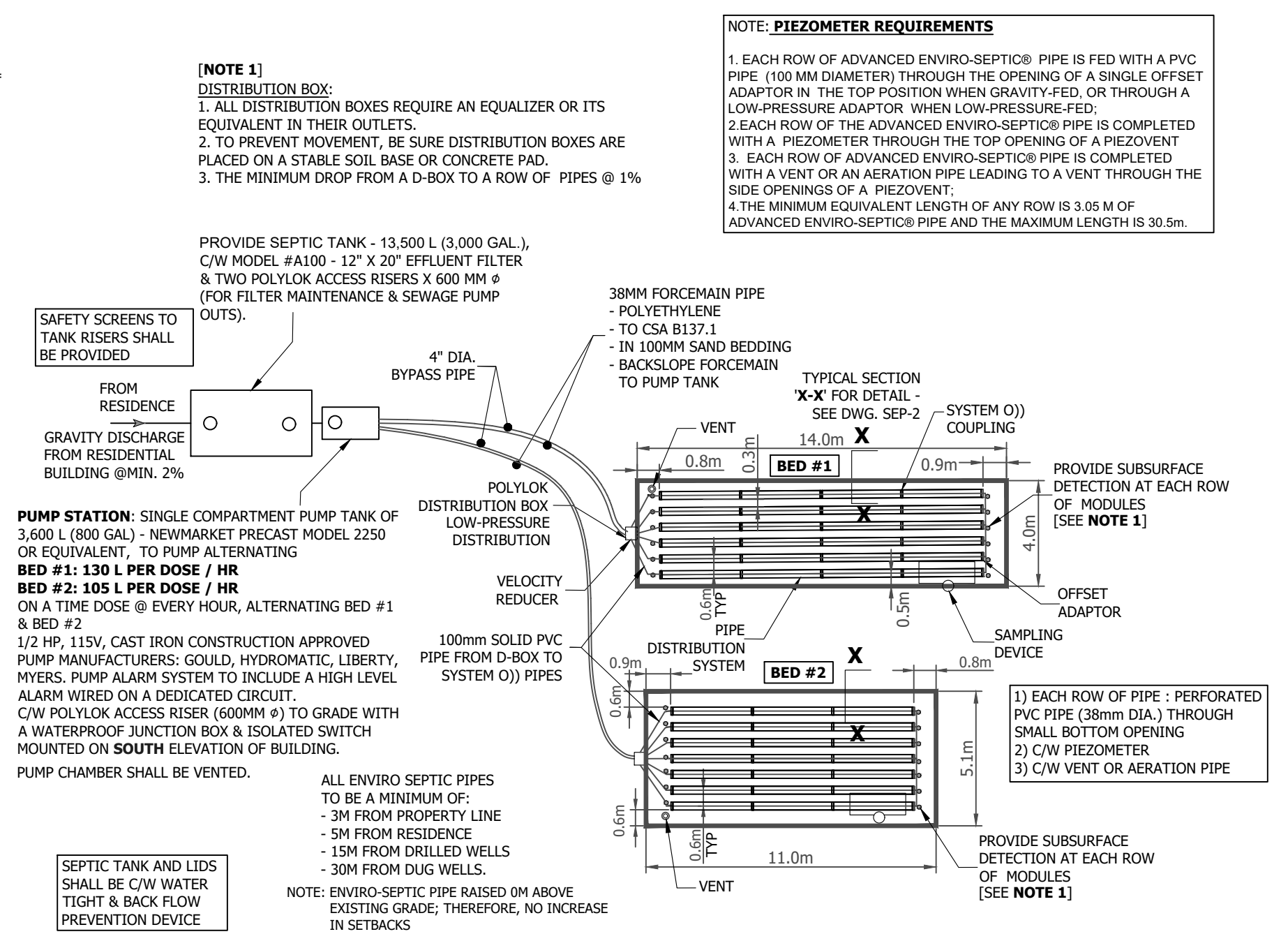
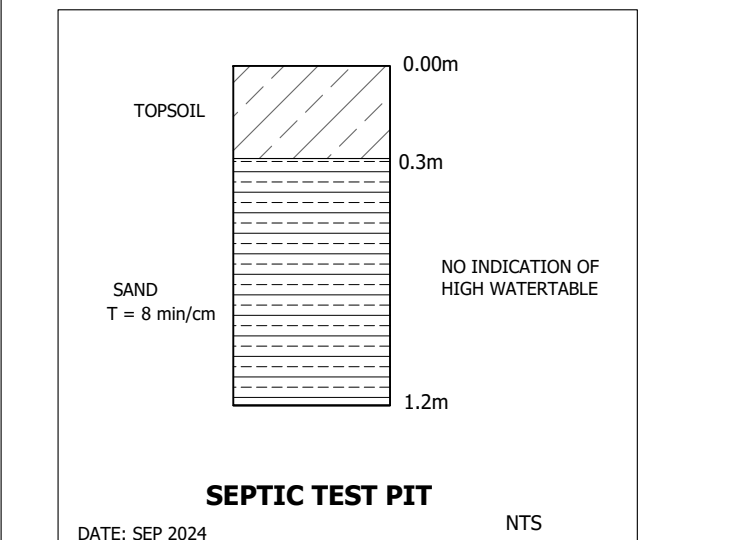
SEPTIC SYSTEM DESIGN: **ADVANCED ENVIRO-SEPTIC® SYSTEM**
01) STANDARD CONFIGURATION
CLASS 4 TERTIARY TREATMENT SYSTEM: BMEC #23-05-407 (ISSUED JULY 26, 2023)
CAN/BNQ 3680-600
ONTARIO BUILDING CODE PART 8, 2024 - COMPLIANCE ANALYSIS
===== PROPOSED RESIDENTIAL OCCUPANCY: =====
8 BEDROOMS
LIVING AREA: 1ST FL: 300.73 SQ.M + 232.35 SQ.M = 533.08 SQ.M
BASE DAILY SEWAGE FLOW: Q = 2,500 L / DAY (5 BEDROOMS)
HYDRAULIC LOAD (FIXTURE UNITS): O.B.C. TABLE 7.4.9.3.
6 - 3 PC BATHROOM GROUP = 6 x 6 = 36,
1 ADD. TOILET = 4.0, 8 KITCHEN SINKS = 8 x 1.5 = 12,
6 DISHWASHERS = 6 x 1.0 = 6.0,
2 WASHING MACHINE = 3.0
TOTAL FIXTURE UNITS = 61

ADDITIONAL FLOW:
I) NO. OF BEDROOM OVER 5 = 3 x 500 = 1,500 L
II) HOUSE SIZE OVER 200 SM = 20 x 1,000 + 14 x 75 = 3,050 L
III) NO. OF FIXTURE UNIT OVER 20 = 41x 50 = 2,050 L
TOTAL DAILY SEWAGE FLOW: Q = 5,550 L/DAY [2,500 + 3,050]
DESIGN FLOW = **5,550 L / DAY**
=====

SEPTIC TANK: 2 x 5,550 = 11,100 L. PROVIDE 13,500 L (3,000 GAL) 2 COMPARTMENT TANK
PROVIDE A PUMP TANK: 3,600 L (800 GAL) SINGLE COMPARTMENT TANK

ENVIRO-SEPTIC PIPE CONFIGURATION:
DAILY AVERAGE HYDRAULIC LOADING RATE = 126 L/MODULE/DAY
NUMBER OF PIPES = Q/126 = 5,550 / 126 = 44.05, 44 PIPES REQUIRED
TOTAL LENGTH OF PIPES: PROVIDE **45 SYSTEM O)) PIPES**
BED #1: 6 ROWS X 4 PIPES = 24 PIPES
BED #2: 7 ROWS X 3 PIPES = 21 PIPES

SEPTIC TEST PIT INVESTIGATION:
BASED ON SANDY SOIL, T = 8 MIN/CM
1) HIGH WATER TABLE - N/A
2) SOIL PERCOLATION TIME: T = 8 MIN/CM
SAND CONTACT AREA:
FOR T = 8 min/cm
LOADING AREA = Q/50 = 5,550 / 50 = 111 SQ.M REQUIRED.
BED #1: 56 SQ.M + BED #2: 56 SQ.M = **112 SQ.M PROVIDED**

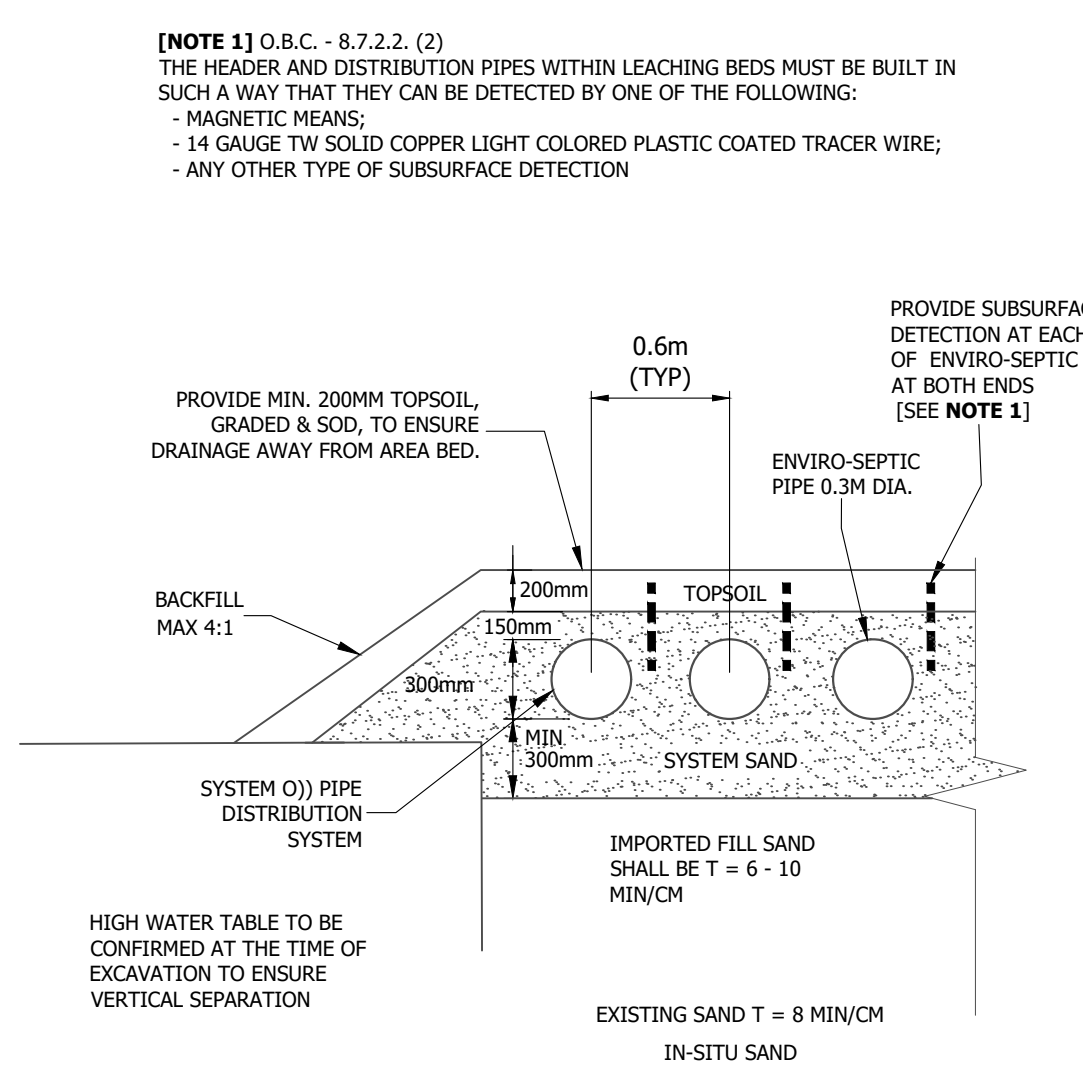


PLAN VIEW - ENVIRO-SEPTIC SYSTEM

SCALE: 1:200

SEPTIC SYSTEM: BED ELEVATIONS		
	BED #1	BED #2
TOP OF LANDSCAPING:	308.15	310.45
TOP OF SYSTEM SAND:	307.95	310.25
BOTTOM OF PIPE:	307.50	309.80
BOTTOM OF SYSTEM SAND:	307.20	309.50
BASE CUT:	307.20	309.50

MINIMUM HORIZONTAL SPACING
Ecc: CENTRE TO CENTRE SPACING FROM ONE ROW OF PIPES TO THE NEXT = 0.45m
EL: LATERAL EXTENSION DISTANCE FROM THE CENTER OF THE LAST LATERAL ROW OF PIPES OF THE LIMIT OF THE ENVIRO-SEPTIC SYSTEM = 0.45m
EE: END EXTENSION DISTANCE FROM THE END OF A ROW OF PIPES TO THE LIMITS OF ENVIRO-SEPTIC SYSTEM = 0.3m



ENVIRO-SEPTIC: CROSS SECTION (TYPICAL)

ELEVATION (m)		
BED #1	BED #2	
308.15	310.45	TOP OF FINISHED GRADE
307.95	310.25	TOP OF SYSTEM SAND
307.50	309.80	BOTTOM OF ENVIRO SEPTIC PIPE
307.20	309.50	BOTTOM OF SYSTEM SAND BASECUT

IMPORTED SAND: HAVING A 'T' TIME OF 6 - 10 min/cm AND NOT MORE THAN 5% OF FINES PASSING THROUGH A 0.0074mm (NO. 200) SIEVE.
THAT IS IMPORTED TO THE SITE TO RAISE THE SYSTEM TO ACHIEVE VERTICAL SEPARATION.
SYSTEM SAND: SPECIFIC CRITERIA
ENVIRO-SEPTIC SYSTEM SAND - MUST MEET THE REQUIREMENTS STATED BELOW:
1) EFFECTIVE DIAMETER (D10) BETWEEN 0.2 AND 0.5 mm;
2) COEFFICIENT OF UNIFORMITY (Cu) < 4.5;
3) LESS THAN 3% OF MATERIAL SMALLER THAN 80µm; AND
4) LESS THAN 20% OF MATERIAL LARGER THAN 2.5 mm.
CONTACT ENVIRO-SEPTIC DISTRIBUTOR FOR A LIST OF SYSTEM SAND SUPPLIERS.

SAMPLING DEVICE SHALL BE INSTALLED PER 'SYSTEM O)); DESIGN & INSTALLATION MANUAL - ONTARIO', JUNE 2023
MAKE-WAY ENVIRONMENTAL TECHNOLOGIES INC.

STANDARD NOTES - PRIVATE SEWAGE SYSTEM (ENVIRO-SEPTIC SYSTEM - CLASS IV), BMEC #23-06-407 (ISSUED JULY 26, 2023)
BNQ 3680-910, MUNICIPALITY OF TRENT LAKES

1.0 ALL COMPONENTS AND CONSTRUCTION SHALL BE IN ACCORDANCE WITH PART 8 OF THE ONTARIO BUILDING CODE 2012, FOR CLASS IV SEWAGE SYSTEMS, AND ALL GOVERNING LEGISLATION.

2.0 ONLY LIQUID WASTES DEFINED AS 'SANITARY SEWAGE' IN PART 2 OF THE OBC SHALL BE DISCHARGED TO A PRIVATE WASTE DISPOSAL SYSTEM.

3.0 THE SEPTIC SYSTEM SHALL BE CONSTRUCTED BY THE LICENSED CONTRACTOR AND ALL FILL AND TOPSOIL SHALL BE PLACED UNDER THE DIRECTION OF THE CONTRACTOR.

4.0 NEW SEPTIC TANK SHALL:

4.1 CONFORM TO CANADIAN STANDARDS ASSOCIATION STANDARD CAN3-B66 'PREFABRICATED SEPTIC TANKS AND SEWAGE HOLDING TANKS';

4.2 BE BEDDED ON 200 MM OF COMPACTED SAND OR CRUSHED STONE.

5.0 ENVIRO-SEPTIC SYSTEM SHALL BE IN ACCORDANCE WITH BUILDING MATERIALS EVALUATION COMMISSION BMEC AUTHORIZATION #23-06-407 (ISSUED JULY 26, 2023). ONLY MANUFACTURER TRAINED AND AUTHORIZED AGENTS SHALL INSTALL THE ENVIRO-SEPTIC SYSTEM.

6.0 THE CONTRACTOR SHALL PROVIDE REASONABLE NOTICE TO THE MUNICIPALITY OF TRENT LAKES OR BJH ENGINEERING LTD., WHEN BJH ENGINEERING LTD. IS ENGAGED BY THE OWNER

TO CONDUCT SITE INSPECTIONS AS FOLLOWS:

6.1 A TEST CUT AS THE LOCATION OF THE PROPOSED SYSTEM.

6.2 THE BASE EXCAVATION FOR A SYSTEM USING IMPORTED MATERIAL.

6.3 THE INSTALLATION OF TREATMENT UNITS OR DISTRIBUTION PIPE.

6.4 BACKFILLING SHALL NOT PROCEED UNTIL EACH STAGE HAS BEEN APPROVED BY THE MUNICIPALITY OF TRENT LAKES OR BJH ENGINEERING LTD.

7.0 THE SYSTEM SAND SHALL MEET ALL OF THE FOLLOWING REQUIREMENTS:

7.1 EFFECTIVE DIAMETER OF BETWEEN 0.20 MM AND 0.50 MM.

7.2 UNIFORMITY OF COEFFICIENT (CU) LESS THAN OR EQUAL TO 4.5;

7.3 LESS THAN 3% OF THE MATERIAL SMALLER THAN 80µm, AND;

7.4 LESS THAN 20% OF MATERIAL LARGER THAN 2.5 MM.

8.0 ELECTRICAL & MECHANICAL EQUIPMENT

8.1 THE CONTRACTOR TO SUPPLY THE PUMP AND MERCURY FLOATS, AS REQUIRED AND POSITION THEM, AS SPECIFIED, IN THE TANKS. THE CONTRACTOR TO SUPPLY ALL ALARM PANELS, TIMER CONTROL PANELS, JUNCTION BOXES AND CONDUIT AND WIRING FROM THE JUNCTION BOX TO THE BUILDING ELECTRICAL ROOM.

8.2 ALL PUMPS TO BE SUBMERSIBLE, 38MM EFFLUENT PUMPS, WITH A 110 VOLT, SINGLE PHASE MOTORS. ALL PUMPS WILL BE PROTECTED FROM RUNNING DRY BY A MERCURY FLOAT ATTACHED TO THE PUMP OR CONTROL PANEL. BALANCING PUMPS SHALL BE CONTROLLED BY ELECTRONIC TIMERS SET AT SPECIFIED TIMES. PUMP / BALANCING PUMPS SHALL BE CONTROLLED BY A MERCURY FLOAT SWITCH SET TO PRODUCE TO PRODUCE THE SPECIFIED DOSE. ALL PUMPS TO BE ON INDIVIDUAL / DEDICATED ELECTRICAL CIRCUITS.

8.3 WATER-TIGHT JUNCTION BOXES AND CONTROL PANEL TO BE MOUNTED ON SOUTH FOUNDATION WALL. THE BOTTOM OF THE BOX WILL BE LOCATED AT LEAST 600MM ABOVE THE GROUND SURFACE. THE CONDUIT CONTAINING THE WIRES FROM THE TANK WILL BE SUFFICIENTLY LARGE TO PERMIT THE PUMP WIRE AND PLUG TO PASS THROUGH THE CONDUIT. THE CONDUIT WILL BE SEALED TO PREVENT THE MOVEMENT OF GAS AND MOISTURE FROM THE TANK INTO THE BOX. THE CONDUIT TO THE BUILDING WILL EXTEND THROUGH THE BUILDING WALL AND WILL BE GROUTED THROUGH THE WALL. THE CONDUIT WILL BE SEALED AT THE BUILDING END. WIRING CONDUITS TO BE EXTENDED TO ELECTRICAL ROOM.

8.4 THE ALARM PANEL, TO BE LOCATED ON SOUTH SIDE WALL, WITH A 2ND AUDIBLE ALARM TO BE LOCATED IN UTILITY ROOM, WILL BE POWERED BY A SEPARATE, INDEPENDENTLY SUPPLIED CIRCUIT WITH ITS OWN BREAKER SWITCH TO AVOID LOSS OF POWER (AND ALARMS) IN THE EVENT THAT THE PUMP CIRCUIT FAILS. ALL SWITCHES & ALARMS TO BE FIELD TESTED.

8.5 ALL ELECTRICAL INSTALLATIONS AND CONNECTIONS WILL BE MADE BY AN EXPERIENCED ELECTRICIAN AND WILL MEET CURRENT ONTARIO HYDRO SPECIFICATIONS AND REQUIREMENTS. OBTAIN REQUIRED PERMIT AND ARRANGE FOR HYDRO INSPECTIONS PRIOR TO COMPLETION.

9.0 USE OF LOW VOLUME PLUMBING FIXTURES RECOMMENDED.

10.0 NO GARBURATOR OR FOOD GRINDER SHALL BE CONNECTED TO HOUSE PLUMBING OR SEPTIC SYSTEM.

11.0 SUMP PUMP AND WATER SOFTENER SYSTEM NOT TO BE CONNECTED TO SEPTIC SYSTEM.

12.0 FILL MATERIAL SHALL BE PLACED IN LAYERS OF 200 TO 300 MM DEPTH AND SHALL BE TRACK COMPACTED.

13.0 DISPOSAL BED AREA AND CONTACT AREA SHALL BE SODDED TO CONTROL EROSION.

14.0 NONE OF THE FOLLOWING SHALL BE PERMITTED IN A TREATMENT UNIT CONTACT AREA.

14.1 LANDSCAPING INVOLVING DECKS, BERMS, FOUNDATIONS, PATIOS, WALKWAYS, DRIVEWAYS, OR TREES.

14.2 STRUCTURES, INCLUDING ANTENNA FOUNDATIONS, SWIMMING POOLS, ACCESSORY BUILDINGS, HEAT PUMPS, HEAT PUMP EXCHANGE GRIDS, OR TENNIS COURTS.

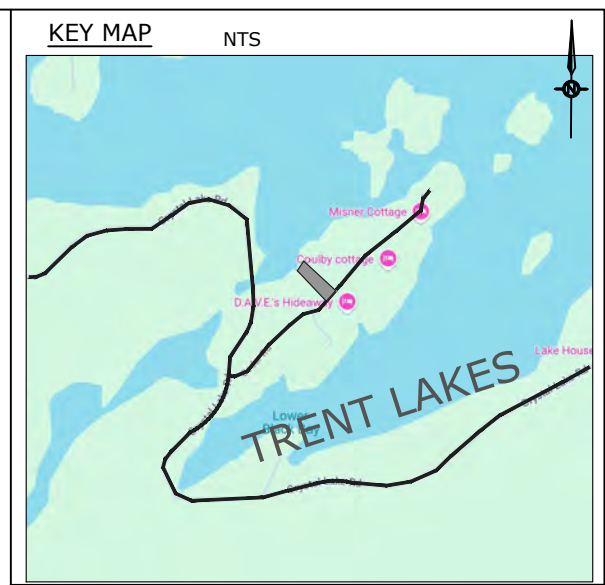
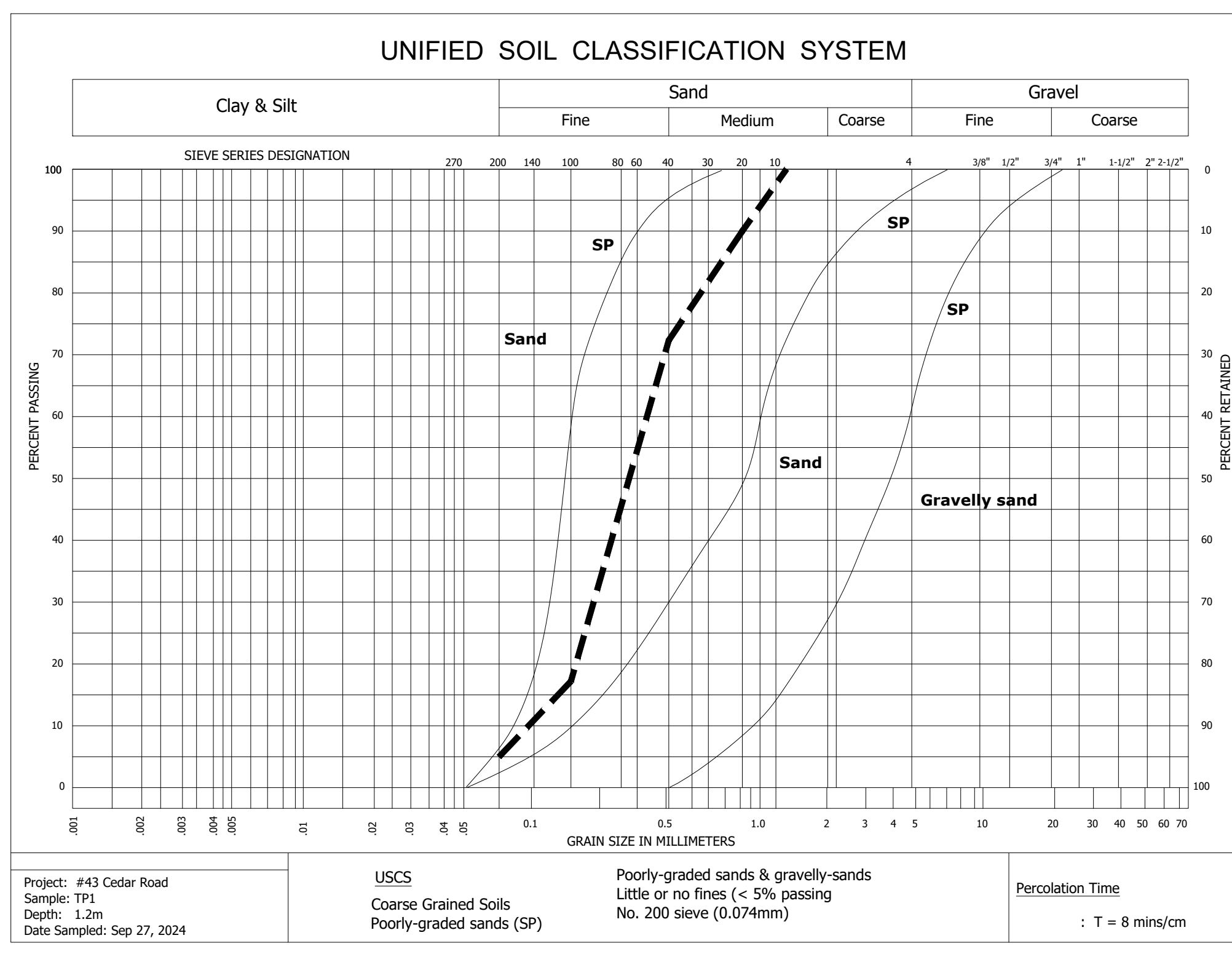
14.3 EXTRANEOUS SOURCES OF WATER INCLUDING AUTOMATIC SPRINKLERS, ROOF DOWNSPOUTS, SUMP DISCHARGES, SOAKAWAY PITS, OR INFILTRATION SYSTEMS.

15.0 SEPTIC TANK ADDITIVES / STARTERS MAY BE HARMFUL TO SEPTIC SYSTEMS AND ARE NOT NECESSARY TO BEGIN OR CONTINUE SEPTIC TANK OPERATION.

16.0 NEVER PUT THE FOLLOWING ITEMS OR SUBSTANCES INTO A SEPTIC TANK SYSTEM: FATS, OILS AND GREASE; GASOLINE, ANTIFREEZE, VARNISHES, PAINTS AND SOLVENTS; CAUSTIC DRAIN & TOILET BOWL CLEANERS; PHOTOGRAPHIC SOLUTIONS; BLEACH; PESTICIDES; NAIL POLISH REMOVERS; CAT BOX LITTER; TAMPONS; SANITARY NAPKINS, DIAPERS, PAPER TOWELS, FACIAL TISSUES, CONDOMS, PLASTICS; COFFEE GROUNDS, EGG SHELLS AND OTHER KITCHEN WASTE, OR CIGARETTE FILTERS.

17.0 ENSURE SEPTIC TANKS ARE INSPECTED AT LEAST EVERY TWO YEARS BY A QUALIFIED PERSON AND PUMP TANKS OUT AT LEAST EVERY 3 TO 5 YEARS (OR SOONER SINCE FREQUENCY DEPENDS ON TANK / HOUSEHOLD SIZE).

18.0 THE PROPERTY OWNER IS REQUIRED TO ENTER INTO A SERVICE AND MAINTENANCE AGREEMENT WITH AN AUTHORIZED COMPANY FOR THE ENVIRO-SEPTIC SYSTEM.



REV.1-MAY 2026: STANDARD CONFIGURATION

RESIDENCE
LOT 10, PLAN 6
43 CEDAR ROAD
MUNICIPALITY OF TRENT LAKES

SEPTIC SYSTEM

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Designed By: BH
Drawn By: BH